Communicating Social Support in Smartphone-Based Addiction Support Groups: Seeking, Giving, and Receiving Emotional Support and their Effects on Alcoholism Treatment

By

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Abstract

The goal of this dissertation is to investigate the nature and roles of four types of communicating emotional support within smartphone-based support groups for individuals with alcohol dependence: (1) seeking support, (2) giving support, (3) receiving support from peer patients, and (4) receiving support from health care providers. I first explore the prediction model to explain how potential factors predict the four types of communicating emotional support. Second, I test the direct and stress-buffering models of communicating emotional support to demonstrate whether the four types of communicating emotional support promote abstinence on risky drinking days. Third, I examine the mediation model of coping to explain how the four types of communicating emotional support are related to risky drinking days via coping strategies.

The smartphone-based support groups examined in this dissertation are online discussion groups within the Addiction-Comprehensive Health Enhancement Support System (A-CHESS) at the University of Wisconsin-Madison. Of the 170 participants who could access A-CHESS discussion groups through their smartphones during the 12-month study period, 153 either wrote or read messages in the groups. The final data used in the analyses were created by merging three data components: (1) messages posted in A-CHESS discussion groups, (2) action log data of A-CHESS discussion group usage, and (3) multiple waves of survey data.

The results of the prediction model showed that each type of communicating emotional support was predicted by unique antecedents. In addition, the findings of the direct and stress-buffering models revealed that communicating emotional support contributed to alcoholism treatment not by producing direct benefits per se but by alleviating or changing the effect of emotional distress to trigger alcohol use. Finally, a coping mediation model showed that coping

strategies mediated the relationship between communicating emotional support and risky drinking days.

Taken together, this dissertation scrutinizes key issues regarding communicating emotional support in smartphone-based alcoholism support groups and delivers the following insights: (1) what people are more likely to communicate emotional support, (2) what benefits or drawbacks are likely to result from communicating emotional support, and (3) how communicating emotional support contributes to alcoholism treatment.

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Chapter 1: Introduction

"Mobile technology allows for easy time-effective coverage of patients at a low cost, offering significant opportunities to improve access to health care, contain costs and improve clinical outcome. Online networks, for example, can promote communication, distraction, information sharing, self-expression and social support. We also believe online networks decrease feelings of withdrawn behavior and instill a greater willingness to return for treatment" (Jamison, 2014, May 1).

Alcohol use disorder refers to a person's intake of alcohol so extensive that it can damage or adversely affect physical and mental health, as well as social and occupational functions. Generally known as alcohol abuse or alcohol dependence, alcohol use disorders have been found to predict a wide range of health and safety problems, including mental disorders (Drake & Brunette, 1998; Kushner, Abrams, & Borchardt, 2000; Morris, Stewart, & Ham, 2005), tobacco dependence (Daeppen et al., 2000; Sher, Gotham, Erickson, & Wood, 1996), other drug disorders (Stinson et al., 2006), and suicidal behaviors (Berglund & Ojehagen, 2006; Foster, 2001). In addition, alcohol use disorders have posed considerable health risks and financial burdens to not only alcoholics themselves but also to their families. A family member with an alcohol use disorder causes a deterioration of family functioning, potentially resulting in mental health problems in other family members and higher medical costs. It has been found that family members of alcoholics are more frequently diagnosed with trauma and stress-related diseases than are members of non-alcoholic families (Ray, Mertens, & Weisner, 2007; Roberts & Brent, 1982).

To address these problems of alcohol use disorders, medical facilities and health care professionals offer a number of treatment options. These include medications, behavioral therapies, screening, and mutual-help groups. Despite the profusion of treatment methods in chronic alcoholism, most alcoholics still fail to receive appropriate treatment. Although in 2012 17 million Americans aged 12 or older were classified as having alcohol use disorders, only 2.4 million people received treatment for alcohol use at any location, such as a hospital, rehabilitation facility, or mental health center (Substance Abuse and Mental Health Services Administration, 2013). More alarming is the lack of extended continuing care in spite of the potentially chronic and relapsing nature of alcoholism (McTavish, Chih, Shah, & Gustafson, 2012). Accordingly, a majority of alcoholics still experience excessive or uncontrolled drinking after treatment (Richter et al., 2012). The reason for the scarcity of continuing care stems from such care being financially overburdened, labor-intensive, and unstable (McLellan, Carise, & Kleber, 2003).

To overcome these limitations, researchers are paying a great deal of attention to emerging mobile communication and network technologies. The increased availability, miniaturization, performance, and enhanced data rates of mobile technologies accelerate the development of mHealth, which refers to mobile computing, medical sensor, and communication technologies for health care (Istepanian, Jovanov, & Zhang, 2004). In general, mHealth is an evolved domain of eHealth that delivers health care services by using information and communication technologies (ICTs). Through their merging of traditional desktop computing and mobile platforms, ICTs are changing the way patients communicate and obtain information. For instance, patients using smartphones, tablets, and/or personal digital assistants are able to not only maintain better contact with health care providers or peer patients 24 hours a day, 7 days a

week but they also actively engage in an appropriate treatment through interactive self-help tools. For example, smartphone technology is greatly helping those with alcohol use disorders access a variety of health care services in cost-effective, flexible, and efficient ways (Cohn, Hunter-Reel, Hagman, & Mitchell, 2011; Gustafson, Shaw, et al., 2011). There is recent evidence that a smartphone-based recovery tool is highly useful in preventing relapses to heavy drinking among people leaving active alcohol dependence treatment (Gustafson et al., 2012; Gustafson et al., 2014; McTavish et al., 2012).

One particularly noteworthy function of mHealth is that it provides patients with opportunities to exchange social support via computer-mediated communication (CMC). Patients are able to exchange social support with health care providers or with peer patients through text messaging, email, and electronic discussion boards. The term of social support has been defined and assessed in several ways, ranging from "structural" to "functional" components of support (S. Cohen & Wills, 1985). Nevertheless, each type has been found to have a substantive influence on the treatment outcomes of alcoholism. Previous research has found that higher levels of structural social support (e.g., the number of supportive resources in the structured social network) predict a lower risk of posttreatment relapse (Havassy, Hall, & Wasserman, 1991; Macdonald, 1987; Rosenberg, 1983). Likewise, functional social support (e.g., actual or perceived emotional and instrumental support) has been found to have positive effects on abstinence outcomes in alcoholism treatment (Beattie et al., 1993; Booth, Russell, Soucek, & Laughlin, 1992; Dobkin, Civita, Paraherakis, & Gill, 2002; Humphreys, Moos, & Finney, 1995). In addition to general social support, alcohol-specific social support has been found to influence alcohol use outcomes (Beattie & Longabaugh, 1999; Groh, Jason, Davis, Olson, & Ferrari, 2007; Longabaugh, Beattie, Noel, Stout, & Malloy, 1993).

Given these findings, it seems plausible that online social support via mobile communication could significantly improve treatment outcomes for people in recovery. For example, smartphones, with their text messaging, e-mail, and Internet capabilities, promote continuous contact between health care providers and problem drinkers (Swan & Tyssen, 2009). Personalized and interactive online counseling helps alcoholic patients request and receive appropriate support from their counselors. More importantly, mobile communication technologies can lead to the proliferation of online support groups for people with alcohol dependence. In recent years, online support groups have become virtual meeting places for individuals facing chronic diseases to share social support (Ancker et al., 2009; J. E. Chung, 2013). They do so through text-based discussion forums, such as bulletin board discussions, mailing lists, and website postings. It has been well-established that social support is frequently exchanged through online support groups across a variety of chronic diseases (Coulson, 2005; Coulson, Buchanan, & Aubeeluck, 2007; Coulson & Kniff, 2007; Eichhorn, 2008; Loane & D'Alessandro, 2013; Mo & Coulson, 2008; M. White & Dorman, 2001; Winzelberg, 1997). For alcohol use disorders, one of the oldest and most successful support groups, Alcoholics Anonymous (AA), has emerged from its traditional church and community center basements to offer an online presence (VanLear, Sheehan, Withers, & Walker, 2005). In online alcoholism support groups, emotional and informational support are frequently enacted through mutually supportive communication behaviors (Alexander, Peterson, & Hollingshead, 2003; Coulson, 2014; VanLear et al., 2005) and the group members have been found to be highly satisfied with the social support they exchange (Green-Hamann, Campbell Eichhorn, & Sherblom, 2011).

Despite the growing body of research on online social support in alcoholism treatment, little is known about the features and benefits of online social support through mobile

interactions in the treatment of alcohol use disorders. Furthermore, there is a critical research gap for a thorough understanding of online social support from the perspective of communication studies. In exploring the exchange of social support, one study (Goldsmith, 2004) dealt with communication processes in the enactment of social support. Given that "social support is a process inextricably woven into communication behavior" (Albrecht & Adelman, 1987, p. 14), enacted social support occurs in the context of conversation, which involves the exchange of social support messages between support providers and support recipients. By analyzing individual messages posted in online health care communities, a number of studies have examined how and what kinds of social support are solicited and then exchanged through online conversations (Coulson, 2005; Coulson et al., 2007; Eichhorn, 2008; Finn, 1999; Loane & D'Alessandro, 2013; Mo & Coulson, 2008; Winzelberg, 1997). Other studies have proved the beneficial impacts of giving and receiving social support messages in online cancer support groups (Han et al., 2011; E. Kim et al., 2012; Namkoong et al., 2014; Namkoong et al., 2010; Yoo et al., 2014).

However, these studies did not fully explicate the communication of online social support and its beneficial impacts. They scrutinized the effects of providing and receiving social support messages via computer-mediated communication (CMC); however relatively few of them focused on the seeking of social support within a computer-mediated environment. Undoubtedly, individuals constantly engage in support-seeking activities to help them when they confront critical moments in their lives. In addition, the source of social support remains as a relatively underdeveloped area in online supportive interactions. The communication of social support has been traditionally conceived as taking place in clinician-patient communication. However, extant

research on online support groups has focused largely on supportive communication among peer patients.

This dissertation thus attempts to fill these gaps in the literature on online social support. Specifically, the primary goal of this study is to investigate the nature and effects of four types of communicating emotional support within smartphone-based support groups for patients with alcohol dependence: (1) seeking emotional support, (2) giving emotional support, (3) receiving emotional support from peer patients, and (4) receiving emotional support from health care providers. For the purpose of this study, I first explore the prediction model to reveal how various demographic, clinical, and psychosocial characteristics predict the four types of communicating emotional support at all three time periods (4, 8, and 12 months). Second, I test the direct and stress-buffering models of communicating emotional support to demonstrate whether the four types of communicating emotional support are related to a low level of risky drinking days at each time period. Third, I examine the mediation model of coping strategies to explain how the four types of communicating emotional support are associated with low risky drinking levels via coping strategies at each time period. By testing these research models, this dissertation will provide more comprehensive, detailed and meaningful accounts of communicating emotional support in smartphone-based addiction support groups.

Overview of Chapters

Chapter 2 provides an overview of the extant literature on social support and its general health benefits. This includes explanations of the conceptualization, measurement, and implications of social support for physical and mental health. It also briefly goes into why emotional support is the most important factor in the context of addiction treatment. Lastly, the

chapter introduces message expression- and reception-effects paradigms. These paradigms are two theoretical frameworks that can be used to explain the potential benefits of communicating social support for individuals with chronic health conditions

Chapter 3 offers an extensive literature review on computer-mediated communication (CMC) and social support exchanges. It focuses on why a CMC environment is attractive and efficacious for exchanging social support and is based on CMC theories. As the next step, I explicate the features and benefits of online support groups for chronic diseases, including alcohol use disorders. The last part of this chapter describes the growth, nature, and effectiveness of smartphone-based alcoholism support groups

Chapter 4 starts by conceptualizing supportive communication in social support research, introducing the theoretical underpinnings of four supportive communication behaviors: seeking support, giving support, receiving support from peer patients, and receiving support from health care providers. This is followed by proposing three research models of communicating emotional support in smartphone-based support groups. On the basis of the literature review of online supportive communication, the relevant research questions and hypotheses are posed to investigate the following research models: (1) prediction model of communicating emotional support, (2) direct and stress-buffering models of communicating emotional support for alcoholism treatment, and (3) mediation model of coping strategies in the relation between communicating emotional support and alcoholism treatment outcome.

Chapter 5 explains how the data were prepared for this dissertation and were statistically analyzed to address research questions. Detailed procedures are described, explaining the collecting, merging, and analyzing of the three data sets: (1) computer-aided content analysis data, (2) action log data, and (3) longitudinal survey data.

Chapter 6 details the results on (1) predictors of communicating emotional support at 4, 8, and 12 months, (2) direct and stress-buffering roles of communicating emotional support for preventing risky drinking days at 4, 8, and 12 months, and (3) the mediating roles of coping strategies in the relation between communicating emotional support and risky drinking days at 8 and 12 months.

Chapter 7 summarizes the major findings of this dissertation and discusses the results in terms of the theoretical, methodological, and practical implications. The chapter also goes over the limitations of this research and directions for future research. The chapter ends with a few concluding remarks on the dissertation project.

Chapter 2: Social Support and Communication

Social Support and Its General Health Benefits

Social support is an umbrella concept that is widely used in a number of disciplines, such as anthropology, epidemiology, medicine, nursing, psychology, social work, and sociology. Because of its attraction to researchers from diverse fields and because much of the pioneering research in these areas has not been theoretically developed, a consensus on how to define social support has been difficult to reach (S. Cohen & Wills, 1985; Uchino, 2004). Indeed, it is defined in many ways, but "information leading the subject to believe that he is cared for and loved, esteemed, and a member of a network of mutual obligations" (Cobb, 1976, p. 300) can serve as a general definition. From this perspective, social support is ultimately based on the meaning behind the supportive messages from others.

Traditionally, social support has been measured according to three dimensions: (1) structural network characteristics, (2) functional receipt of support, and (3) perceived support. Among these, the most commonly used measures are those of functional support, assessing the extent to which social network members provide practical and useful aid to one another (S. Cohen, Underwood, & Gottlieb, 2000). Although there are a number of taxonomies of functional support, most of them consist of three basic functions: (1) emotional, (2) informational, and (3) instrumental support (House, 1981; House & Kahn, 1985; Thoits, 1985). First, emotional support refers to providing love, empathy, caring, and trust (House, 1981; Krause, 1986). It is rendered through information that leads individuals to believe they are cared for and loved, esteemed, and valued and that they belong to a network of communication and mutual obligation (Cobb, 1976). Informational support is defined as providing advice, suggestions, information, knowledge, and

guidance during a time of stress (House, 1981; Krause, 1986). Lastly, instrumental support refers to providing tangible goods and services (House, 1981).

Two theoretical frameworks have been commonly used to explain the benefits of social support in the context of health. As an early and relatively general perspective, the direct effects model of social support posits that the support from being engaged in a network improves one's overall well-being, enabling one to avoid or manage deleterious health events. Those who participate in social interactions are subject to social controls and peer pressures that influence normative health behaviors. These behaviors include exercising, eating better, abstaining from smoking, and moderating alcohol intake (S. Cohen, 1988). A person who is part of a social network is also expected to enjoy a source of generalized positive affect, senses of predictability and stability, feelings of belonging and security, and recognition of self-worth (Cassel, 1976; Hammer, 1983; Wills, 1985). These positive psychological states are presumed to reduce psychological despair, promote greater motivation to care for oneself, and to result in the suppression of neuroendocrine or to enhance immune competence (Cassel, 1976; S. Cohen, 1988; S. Cohen & Syme, 1985; Thoits, 1985; Uchino, Cacioppo, & Kiecolt-Glaser, 1996). Having a wide range of network ties also provides multiple sources of information that can influence health-relevant behaviors or aid one to cope with stressful or other high-risk situations. A social network may help prevent disease by offering network members tangible and economic services that result in better health outcomes.

The second theoretical framework is the stress-buffering effects model of social support. This perspective holds that social support mitigates the impacts of stress and negative events on well-being (S. Cohen & McKay, 1984; S. Cohen & Wills, 1985; Thoits, 1982). The aforementioned direct effects model suggests that social support has a beneficial effect on health

or well-being regardless of whether individuals are under stress. However, the buffering effects model argues that social support lessens the deleterious effects of stress on well-being for individuals who experience more extreme stressful conditions. In particular, the buffering effects of social support can be important for people living with chronic diseases, facilitating effective management of their conditions. Helping chronically ill patients to manage the social, emotional, and physical stresses of their health conditions can improve their physical and mental well-being. According to a review article by Helgeson and Cohen (1996), people suffering from life-threatening or chronic illnesses can be the beneficiaries of the three major types of social support such as emotional, informational, and instrumental support. Emotional support can improve patients' self-esteem or reduce feelings of personal inadequacy by making them feel that they are valued and loved. Such support can not only promote the expression of feelings that may reduce distress but also lead to greater attention to and improvement of interpersonal relationships. Informational support may enhance perceptions of control by providing patients with ways of managing their illnesses and coping with symptoms. Learning how to manage the illness may also enhance patients' optimism about the future and thus reduce anxiety about future vulnerability. Finally, instrumental support can ameliorate the sense of confusion that arises from being diagnosed with chronic diseases by helping patients understand the cause, course, and treatment of the illnesses. This kind of support provides tangible resources that patients can use to exert some control over their experience. Thus, it may offset the loss of control that patients feel during disease treatment.

Why Emotional Support Matters in Addiction Treatment

It is widely known that emotional distress leads people to substance abuse, ultimately to addiction (Sinha, 2001). Most major theories of addiction assume that emotional distress plays a pivotal role in increasing the abuse of addictive substances. For example, the tension reduction (Conger, 1956; Sher & Levenson, 1982), self-medication hypotheses (Khantzian, 1985), and affect regulation theory (Cappell & Greeley, 1987) propose that people use drugs to enhance mood and alleviate emotional distress. The stress-coping model of addiction (Shiffman, 1982; Wills & Shiffman, 1985) also suggests that use of addictive substances reduces negative emotions and thus people take alcohol and other drugs to cope with emotional distress. Similarly, social learning theory argues that substance consumption is an effective way to cope with tension, anxiety, and negative emotions (Cooper, Russell, & George, 1988).

A particularly serious concern then for individuals who are vulnerable to substance abuse is emotional distress. For those who abuse alcohol and drugs, emotional distress has been identified as a central factor determining treatment outcomes. Specifically, negative emotional states are the leading relapse trigger across alcohol and other drug abuse (Hodgins, El-Guebaly, & Armstrong, 1995; Sandberg & Marlatt, 1991) and emotional problems are positively related to treatment attrition (Booth, Loveland Cook, & Blow, 1992; Curran, Kirchner, Worley, Rookey, & Booth, 2002; Doumas, Blasey, & Thacker, 2005; Fals-Stewart & Lucente, 1994). It has been well documented that emotional distress increases the risk of alcohol relapse after treatment completion and discharge (S. A. Brown et al., 1990; Cooney, Litt, Morse, Bauer, & Gaupp, 1997). According to human laboratory and brain-imaging studies, emotional distress and alcohol consumption are linked through psychobiological and neural evidence (Sinha, 2001, 2012). Specifically, chronic alcohol use can lead to neuroadaptive changes in stress and reward

pathways. Such changes may alter an alcohol-dependent person's response to stress and emotion regulation, which in turn may increase the risk of relapse.

In this situation, emotional support can be considered as a crucial factor influencing the effects of emotional distress on outcomes in the treatment of alcohol and drug addiction. According to optimal matching theory, social support is a multidimensional construct and that certain types of social support may be most effective when matched with certain types of stressful incidents (Cutrona & Russell, 1990). In other words, desired outcomes are hypothesized to result from a match or fit between the demands of stressors and the functions of social support. Given that emotional distress increases the risk of alcohol and drug abuse, emotional support may be the most necessary support for alcohol and drug abuse patients vulnerable to emotional distress. Previous research found that higher levels of emotional support during treatment for alcoholism were positively associated with greater psychological well-being (Beattie et al., 1993; Booth, Russell, et al., 1992). In addition, coping with chronic disease can be categorized as a negative and uncontrolled event, one that requires emotion-focused coping so as to address fear, anger, and depression (Cutrona & Russell, 1990). That is, individuals with alcohol and drug addiction problems may have a high need for emotional support.

For these reasons, emotional support may be especially important in relapse prevention for alcohol and drug problems. Patients with higher levels of emotional support are more able to handle their own emotions when confronting emotional distress. Thus, they may be less likely to consume alcohol and other drugs to cope with such distress. Furthermore, emotional support may enhance self-confidence and self-esteem which enable patients to surmount the addiction problem for at least a short period of time following treatment (Beattie & Longabaugh, 1999).

For instance, encouragement to abstain can be especially helpful when old drinking habits are still fresh in the patient's mind.

Consistent with these suggestions, emotional support has been empirically proved to be effective in improving addiction treatment. Macdonald (1987) found that women alcoholics who had many close and emotionally supportive relationships tended to do better in terms of sobriety than those who were emotionally isolated. Similarly, Dobkin and colleagues (2002) found that alcohol-dependent patients with high emotional support reported significant declines in the severity of alcohol abuse. With regard to other drug abuse, Havassy, Wasserman, and Hall (1995) found that cocaine-abusing patients who reported higher levels of emotional support during the post-treatment period were more likely to remain abstinent over a three-month period. Gogineni, Stein, and Friedmann (2001) found that drug-injecting patients who reported having more emotional support in their lives were less likely to share needles.

Individuals with alcohol and drug addiction problems are able to find emotional support from a wide variety of sources, such as family members, friends, peer patients, and health care professionals. Among them, emotional support from mutual-aid support groups has played a vital role in alcohol and drug addiction recovery (Magura et al., 2003; W. L. White, 2009). In this context, emotional support highlights two of Yalom's (1985) therapeutic factors in group psychotherapy. The first one, universality, is defined as learning that others have the same type of problem or are in similar circumstances. The other one, group cohesiveness, is the perception that members of the group understand and accept each other. The perception of a common bond has been considered a primary benefit in support groups for alcohol and drug abstinence such as Alcoholics Anonymous (AA) and Narcotics Anonymous (NA). One group member stated that "we are all different, but our illness is our alikeness" (DuPont & McGovern, 1994, p. 114).

Individuals facing a similar health-related problem are in a unique position to understand one another in ways that one's friends or family may not (Helgeson & Gottlieb, 2000). Members of support groups are likely to exchange emotional support when they believe that they share similar difficulties, misery, pain, disease, condition, or distress. In other words, support groups can serve as an attractive place for emotional support by creating a therapeutic environment that encourages honest and open communications and that provides participants with opportunities to freely disclose their problems and concerns.

Health Benefits of Communication Behaviors: Message Expression and Reception

For individuals with addition problems, the process of recovering from addiction is often a traumatic and stressful experience. According to theories of adaption to trauma (Creamer, Burgess, & Pattison, 1992; Lepore, 2001), being able to cognitively and emotionally process such a traumatic experience can result in treatment success. This processing can be facilitated by certain communication behaviors. For example, a widely used therapeutic tool is having patients write down their thoughts and emotions. It is believed that doing so provides unique psychological and physical health benefits.

The benefits of message expression were originally derived from the basic writing paradigm developed by Pennebaker and colleagues (Pennebaker, 1997a, 1997b; Smyth & Pennebaker, 1999). Pennebaker and Beall (1986) suggested that "writing about earlier traumatic experience was associated with both short-term increases in physiological arousal and long-term decreases in health problems" (p. 280). Using the writing paradigm, researchers have proved that numerous therapeutic interventions lead to various health benefits (see Pennebaker, 1997b). Two theories have been proposed to explain about the mechanisms by which writing exerts its

positive effects. The inhibition theory holds that a great deal of stress goes into constraining thoughts, feelings, or behaviors regarding an emotional upheaval. Such stress may be reduced by disclosing these experiences (Pennebaker, 1989). The cognitive change theory asserts that writing helps individuals organize their thoughts and feelings about traumatic experiences and create more coherent or meaningful narratives about the events in their lives (Pennebaker & Seagal, 1999). Both theories share the ideas that writing helps relieve the stress or other difficulties associated with repression and that it helps one make sense of a chaotic emotional experience.

Apart from the field of psychotherapy, message expression has long been a focus of communication studies. Some communication scholars have argued that message expression has important effects on the message producer because it relies on a self-reflective process and cognitive activity (Blumler & Katz, 1974; Chaffee & Schleuder, 1986; Eveland, 2001). While the reception of messages is generally a passive activity, the construction of them requires cognitive elaboration, as one considers not only what one wishes to express but also the way in which that expression is likely to be received (Eveland, 2001, 2004). Indeed, after one has expressed a message, one may perceive its meaning differently once cognizant that others will read it. This process, also called reasoning, refers to mental elaboration or collective consideration, and it encompasses both intrapersonal and interpersonal ways of thinking (Cho et al., 2009; Shah et al., 2007). In fact, message writers can be affected by their own message after mentally elaborating on how others might perceive their message. “The act of expression might change the message sender, that expressed ideas often do not exist intact, if at all, in the sender’s mind prior to expression” (Pingree, 2007, p. 439). Thus, the results of message expression may be an outcome of the influences the expression behavior has on message composers.

On the other hand, it has been argued that message reception has a substantial effect on the message recipients' thoughts, attitudes, or behaviors. The effect of receiving messages occurs through several stages. According to message learning theory (Hovland, Jains, & Kelley, 1953), a message recipient has been exposed to message content, attends to the content, and comprehends the content. The person can then evaluate the message by comparing its information with that stored in memory. The information comparison process results in a degree of acceptance or rejection of the message conclusion. Information processing theory (McGuire, 1968, 1969) proposes a comparable of six stages: (1) exposure, (2) attention, (3) comprehensive, (4) message evaluation, (5) belief change, and (6) attitude change. Likewise, the elaboration likelihood model (ELM) of persuasion (Petty & Cacioppo, 1986b; Petty, Cacioppo, & Goldman, 1981) claims that message receivers pass through the stages of exposure, motivation, ability, message evaluation and cognitive elaboration, belief change, and attitude change.

Obviously, message reception has been a main research area of health communication. Health communication research has traditionally been dominated by a message reception-effects paradigm in which most effects of communication are conceived as a consequence of informational or persuasive message reception (Fishbein & Cappella, 2006). Based on the message reception-effects paradigm, a great deal of research has been devoted to exploring the different types of persuasive messages to predict message receivers' health attitudes and behaviors. For example, narrative health messages have been effective in promoting health behaviors for cancer prevention and control (Green, 2006; Kreuter et al., 2007; Wise, Han, Shaw, McTavish, & Gustafson, 2008). Engagement with a storyline is especially well suited for amplifying the effect of cancer-related information for the following reasons: It reduces counterarguments; it provides the indirect experience of unknown, difficult, or frightening

treatments; it proposes role models for behavior change; and it promotes strong competence (Green, 2006). To change health-related behaviors, health care providers have generally used tailored health messages. These messages enhance message receptivity by improving the relevance and salience of health information for a given audience (Rimer & Kreuter, 2006). Message framing has been found to be an effective message strategy to motivate behavior change across a range of health practices (Rothman, Bartels, Wlaschin, & Salovey, 2006). The premise here is that shifting the frame of health messages can affect people's willingness to perform a particular health behavior. For example, a gain-framed message highlights the benefits of engaging in a health behavior, and a loss-framed message highlights the costs of not doing so (Gerend & Maner, 2011).

Chapter 3: Exchanging Social Support Online

Computer-Mediated Communication (CMC) and Social Support Exchanges

Earlier theories of computer-mediated communication (CMC) have largely argued the limitations of characteristics of CMC in the exchange of social support. For example, social presence theory (Short, Williams, & Christie, 1976) posits that communication media vary in their capacity to deliver the feeling one has that other persons are involved in a communication exchange, that is, to deliver social presence. Compared to face-to-face communication, CMC is extremely low in social presence, as it typically transmits no nonverbal, visual, or auditory codes (Hiltz, Johnson, & Turoff, 1986). Thus, as social presence declines online, CMC becomes more impersonal. Media richness theory (Daft & Lengel, 1984, 1986) classifies communication media into rich and lean media. The classification is based on a continuum of "richness" that refers to the ability of media to carry nonverbal cues, provide immediate feedback, support for natural language, and convey personalized messages. Rich media are better suited to intensive interactions, more complex information and emotional content, and more complicated exchanges of messages between people. Lean media are more appropriate for conducting simple, task-oriented types of communication. In terms of these criteria, CMC is considered very lean, effective for impersonal tasks (Daft, Lengel, & Trevino, 1987). Social context cues theory (Sproull & Kiesler, 1986) also asserts that a medium is perceived as providing the communicators with social context cues, including aspects of physical environment and nonverbal behaviors. CMC deters interpersonal communication by occluding the social context cues. In sum, these theories are aligned with the cues-filtered-out perspective (Culnan & Markus, 1987). This perspective suggests that a lack of nonverbal and social context cues influences communicators' interpersonal impression formation and their perception of the communication

context; consequently, this lack constrains communicators' selection and interpretation of messages. In other words, CMC undermines the communication of social support because it reduces or filters out important physical and contextual cues that convey socioemotional information during interaction (Walther & Parks, 2002).

However, contrary to this perspective, the latter theories of CMC support that individuals are able to overcome the relative lack of social contextual cues and develop supportive online networks. For instance, the social information processing (SIP) theory of CMC (Walther, 1992) asserts that CMC is basically devoid of nonverbal communication cues. Nevertheless, CMC participants can still form impressions and develop relationships by utilizing other cues to convey social information. In other words, "without nonverbal cues, communicators adapt their relational behaviors to the remaining cues available in CMC such as content and linguistic strategies, as well as chronemic and typographic cues" (Tidwell & Walther, 2002). Therefore, CMC users simply need additional time for impression development and relational management because electronic streams of verbal communication without nonverbal cues contain less information than multimodal face-to-face interactions. Indeed, the relative lack of visual, aural, and contextual cues in CMC only slows down the development of intimate relationships. Accordingly, the main difference between CMC and face-to-face communication is not the capability to develop supportive relationships but the pace at which supportive relationships develop in each space.

As a further extension of SIP theory, the hyperpersonal model of CMC (Walther, 1996) posits that "CMC users sometimes experience intimacy, affection, and interpersonal assessments of their partners that exceed those occurring in parallel face-to-face interactions" (Walther, Slovacek, & Tidwell, 2001, p. 109). Individuals can utilize the technological aspects of CMC in

order to manage impressions and facilitate desired relationships online. More specifically, the hyperpersonal model specifies several concurrent dynamics in sender, receiver, channel, and feedback systems that are affected by CMC attributes, which promote the development and potential exaggeration of impressions and relationships online. As senders, CMC users selectively self-present, which entails revealing attitudes and aspects of the self in a controlled and socially desirable fashion (Walther, 2007). For example, in a text-based CMC, people optimize impression management by putting extra thought into message composition (Walther, 2007; Walther et al., 2001). Thus, the message senders appear to be more comfortable disclosing personal information in CMC than in face-to-face settings (Joinson, 2001; McKenna & Bargh, 1998). As receivers, CMC users make intensified perceptions of status for both self and partners based on the circumstances or message elements that suggest minimal similarity or desirability available in text-based interactions (Boucher, Hancock, & Dunham, 2008; Hancock & Dunham, 2001). The intensified impressions of the sender's personal qualities and their relationships lead to increased intimacy in CMC conversations. In addition, the CMC channel contributes to the deliberate construction of favorable online messages (Walther, 2011). By using a variety of CMC channels, users may take some time to craft optimally desirable messages with greater care than is generally possible in parallel offline conversations. Namely, CMC users can stop and think, edit, rewrite, even abort and re-start messages to make them reflect intended effects before sending messages. CMC allows more intended and desirable message construction (Walther et al., 2001) and thus CMC users can concentrate on positive social/relational aspects of communication. Finally, CMC offers dynamic feedback which is conceptualized as reciprocal interaction with others that reinforces one's online performance by transforming the potentials of the other important elements mentioned above (Walther et al., 2011). For example, receivers'

feedback to senders reinforces the cycle of exaggerated performance and perception, transforming online encounters to reflect more positive impressions and greater intimacy in CMC than in face-to-face settings (Walther, 1997).

Drawing from the two theories discussed above, we may assume that CMC can facilitate close, intimate, and relational communication that becomes more desirable for supportive communication than that which might be achieved in parallel, face-to-face interactions. For example, CMC has been found to make more intense impressions (Hancock & Dunham, 2001) and more positive relations (Walther, 1995) compared to face-to-face communication. Many studies have also found that text-based CMC interactions lead to more self-disclosure, more personal questions, or more expressions of affinity relative to face-to-face interactions (Antheunis, Schouten, Valkenburg, & Peter, 2012; Jiang, Bazarova, & Hancock, 2013; Tidwell & Walther, 2002; Walther, Loh, & Granka, 2005).

These intrinsic properties of CMC have several advantages for the efficient and effective exchange of social support. First, CMC has a high availability of communication, providing support seekers with easy access to social support. In a face-to-face interaction, a support provider may not be available at the precise time when a support seeker needs help (Leatham & Duck, 1990). In addition, there may not be most helpful or expert sources of support within one's normal geography. However, in a CMC environment, people can exchange support with one another 24 hours a day, 7 days a week, and regardless of geographic location (Finfgeld, 2000; Finn, 1999; Salem, Bogat, & Reid, 1997; Winzelberg, 1997). Even persons with mobility problems due to geographic and transportation barriers can participate in supportive communication with ease. With these advantages, CMC forms a substantially larger network of social support than is available offline.

Second, CMC facilitates asynchronous communication that frees individuals from having to coordinate their schedules to communicate at a specific time (B. R. Shaw, McTavish, Hawkins, Gustafson, & Pingree, 2000). Asynchronous communication typically takes place when people post messages on online bulletin boards or send electronic messages to others. That is, writers post messages that are stored online for some period of time for others to read, with readers logging in and responding at different times. Asynchronous interaction allows deliberate thinking and writing (Hiemstra, 1982; B. R. Shaw et al., 2000; Xie, 2008). Since people can spend more time and thought to compose their messages in a CMC environment (Walther, 1996), they can carefully develop messages at their own pace (M. White & Dorman, 2001). This feature is especially advantageous for persons with partial or complete loss of the ability to communicate orally (Braithwaite, Waldron, & Finn, 1999) or older adults who respond to others' posts at their own speed (Kanayama, 2003). In addition, both support providers and recipients feel less pressed or are less disturbed by messages placed on an online discussion board because they are able to use the bulletin board in order to post queries or response asynchronously, without expectation for real-time interaction. In other words, the asynchronous nature of CMC allows time to craft a well-stated request or an apt response that improves potentially the actual quality of social support. For these reasons, most dedicated effective exchanges of social support work via asynchronous communication (Walther & Boyd, 2002).

Third, CMC provides anonymous communication. According to the social identity model of deindividuation effects (Lea & Spears, 1992), CMC users need not attune themselves to one another on the basis of their inter-individual differences, such as sociodemographic factors and signs of physical appearance. The visual anonymity leads to deindividuation or a loss of awareness with regard to one's own and others' individuality. The anonymous nature of CMC

may promote the exchange of social support online. Soliciting support or providing support often inevitably includes individual concerns or personal issues that most people are reluctant to voice in a face-to-face encounter. In a text-based CMC, individuals are free of the expectations and constraints naturally imposed by those who know them personally. They are also immune to the costs and risks of social sanctions that might result from what they say (Bargh, McKenna, & Fitzsimons, 2002). Thus, they can disclose extremely personal details in requesting social support, and others respond with equally intimate details as they relate similar experiences or traumas of their own (Walther & Boyd, 2002). Moreover, they can discuss potentially embarrassing topics or otherwise taboo subjects, increasing the possibilities of self-disclosure, and encouraging honesty and intimacy (M. White & Dorman, 2001).

Finally, CMC promotes tailored communication that allows recipients to receive information customized to meet each person's interests and preferences. According to the elaboration likelihood model (Petty & Cacioppo, 1986b), tailoring induces in-depth processing of message content and thereby tailoring messages may influence health-related attitudes or behaviors. Tailored communication can also generate desired outcomes of health communication by increasing perceived relevance, perceived interactivity, perceived involvement, perceived community, and perceived novelty (Kalyanaraman & Sundar, 2006). A number of online interventions providing social support have employed this approach and showed the positive effects on health outcomes. In a recent review of well-designed interventions, such online social support tailored to the unique needs and interests of individual subjects was shown to be more effective than traditional health communication approaches in helping some patients quit smoking, reduce their dietary fat intake, increase levels of physical activity, and get

mammograms, cholesterol tests, and childhood immunizations (Kreuter, Farrell, Olevitch, & Brennan, 2000).

Online Support Groups and Alcoholism Treatment

With the recent development of information and communication technologies (ICTs), more and more people are going online for social support. Cyberspace is now able to provide information, advice, encouragement, companionship, and even tangible help. People can seek a range of aids from complete strangers in relatively large networks (Walther & Boyd, 2002). For example, individuals exchange social support via text-based modes of online communication, including Usenet newsgroups, electronic bulletin boards, chat rooms, and listserv/mailing lists (Herring, 2002; M. White & Dorman, 2001; Wright, 2002). Using these interactive communication tools, people facing life-threatening illnesses can aggregate online to seek or share reliable information, emotional support, and valuable experiences.

Among individuals with chronic diseases wanting to exchange social support, online support groups have been recognized as the most helpful and attractive source. The widespread diffusion of personal computers and the Internet has given rise to online support groups. Even though online support groups can operate through various Internet applications, the most typical form seems to be an online bulletin board. Participants take advantages of its asynchronicity as well as various other features, such as easy access, opportunity for archival search, convenient use of emoticons and links, and friendly design (Meier, 2004). Of course, websites like WebMD and Yahoo! Groups offer similar discussion forums where individuals concerned with a specific health problem share social support. However, online support groups have different features, such as educational and group communication components, closed membership enrollment, fixed

duration, and expert leadership (Gottlieb, 2000; Helgeson & Gottlieb, 2000). Although online support groups are rooted in the same basic principles as face-to-face support groups, they can foster the exchange of social support by utilizing the unique features of computer-mediated communication (CMC) discussed above. Rains and Young (2009) noted that online support group members can gain access to support when they most need it because they are unconstrained by geography or time. Reduced social cues, such as the inability to see others in the group, may also help people feel comfortable in sharing potentially embarrassing information or discussing stigmatized topics. Moreover, interaction within online support groups is typically asynchronous so that the group members can more effectively manage how and what they contribute to discussions than individuals in offline support groups.

The theory of weak ties (Granovetter, 1973) has been used as a framework for both understanding why patients are more likely to participate in support groups and explaining why such involvement is effective in improving their health outcomes. Most individuals tend to rely on close family members and friends when they need support to cope with significant stressful events (Albrecht & Goldsmith, 2003). Strong tie-networks (e.g., family and friends) are uniquely capable of providing competent and valuable support in that they provide bonding, specializing in the most intimate expression of support such as listening, caring, and affection (Gottlieb & Bergen, 2010). However, individuals facing serious health challenges often look not for strong-tie networks but for weak-tie ones (Granovetter, 1973). Many patients struggle to obtain the proper support from friends and family because they may feel that their close ties lack experience or have limited information about certain health conditions they are confronting. When communicating with a loved one, people are often reluctant to talk about serious health problems that could lead to stigma and discrimination. Thus, chronically ill patients are more

likely to communicate social support with the members of weak-tie networks rather than those of strong-tie networks. Some scholars assert that weak-tie networks have several advantages in exchanging social support (Granovetter, 1982; Park, Adelman, & Albrecht, 1987). Wright and Miller (2010) identified some characteristics of weak-tie networks that may be advantageous in supporting people with chronic health concerns: (1) "greater utility related to increased situational similarity," (2) "greater objectivity resulting from less emotional attachment," (3) "greater security stemming from the reduced interpersonal risk of weak ties," and (4) "greater interpersonal comfort associated with reduced social complications and less stringent role obligations relevant to reciprocity failure" (p. 504).

Because of these advantages, online support groups have been widely used for social support in a variety of chronic diseases (Coulson, 2005; Coulson et al., 2007; Coulson & Kniff, 2007; Eichhorn, 2008; Loane & D'Alessandro, 2013; Mo & Coulson, 2008; M. White & Dorman, 2001; Winzelberg, 1997). Among them, alcohol addiction has been increasingly recognized as a chronic disease which benefits from online support groups. Online social support is a preferred mode of social support for people suffering from addictions. To be sure, addicted people typically acknowledge more psychiatric symptoms of drug use online than through face-to-face interactions (Rosen, Henson, Finney, & Moos, 2000). Accordingly, alcohol-dependent individuals are more likely to engage in online support groups and benefit from the group participation.

In support of this expectation, prior studies have shown that alcoholic patients exchange social support messages in online support groups. An analysis of online bulletin board messages posted by problem drinkers revealed that the most common themes were providing emotional support and suggestions to other group members and expressing gratitude for support received

(Cunningham, van Mierlo, & Fournier, 2008). Similarly, another study of messages posted on an online discussion board for rural women with alcoholism found that women posted specific messages to introduce themselves, provide progress reports, discuss abstinence goals and drinking triggers, and share hope, empathy, and advice (Finfgeld-Connett, 2009). Other studies found that users of an alcoholism community exchanged emotional and informational support with each other via online discussion forums (Chuang & Yang, 2010, 2012a, 2012b). In a more recent study that analyzed messages posted on online alcoholism discussion forums in the United Kingdom, Coulson (2014) found three themes related to social support. The first was sharing to describe the process of disclosure and aspects of problem drinking. The second was supporting to provide ways through which members of the group engaged in mutually supportive communication. The last theme, sobriety, represented the collective goal for forum members and the challenges of achieving and maintaining this state.

There is also growing evidence on the effectiveness of online support groups in recovery from alcohol addiction. According to recent reviews of randomized controlled trials for people with alcohol-related problems (Khadjesari, Murray, Hewitt, Hartley, & Godfrey, 2011; A. White et al., 2010), online social support interventions have contributed to small but meaningful differential reductions in alcohol consumption, blood alcohol concentration, and a range of other alcohol-related measures. As a pivotal component of the inventions, online support groups have been well suited to social support for people suffering from alcohol use disorders. For example, Cunningham (2012) found that the participants of online alcoholism support groups showed a significant reduction in alcohol consumption at a 6-month follow-up. These online support groups were particularly efficacious for social support among people with alcohol problems in rural and remote areas.

Online Support Groups Are Going Mobile: Smartphone-Based Support Groups

More recently, social support is being exchanged through new modes of online communication, such as smartphones, text messaging, and social networking sites (Alison Bryant, Sanders-Jackson, & Smallwood, 2006; Chou, Hunt, Beckjord, Moser, & Hesse, 2009; Greene, Choudhry, Kilabuk, & Shrank, 2011; McTavish et al., 2012). In particular, mobile information and communication technologies (ICTs) have incorporated many features from conventional forms of computer-mediated communication (CMC). A hand-held mobile personal computing and communication device offers full operating system functionality and the performance of modern laptops and desktop personal computers, along with seamless networking and session and application persistence for supporting voice, video, and data communications. Thus, mobile ICTs can be used to develop social networks for exchanging social support among chronically ill patients (Roblin, 2011).

In particular, the smartphone is one of the most advanced communication technologies around the world. It is a mobile phone that offers not only the standard features such as voice and text communication, but also advanced computing and communication capability, including Internet access, global positioning systems (GPS), and data retrieval and management (Boulos, Wheeler, Tavares, & Jones, 2011). Given their portability, affordability, availability, and feasibility, smartphones can be used as a means to promote the exchange of social support online. In recent years, the explosive rise in smartphone users enables the users to connect with their support networks anytime, anywhere. According to a recent survey by the Pew Research Center, over half of all American adults now own a smartphone, and 93% of these smartphone owners use their phone to go online (Duggan & Smith, 2013). Furthermore, 44% of all smartphone owners use a social network site on their phone (Ogasawara, 2011). Therefore, social networking

via smartphone can be utilized to build relations and social support among members of a community (Ankolekar, Szabo, Luon, & Huberman, 2010).

Given the growing popularity and advantages of smartphones, it is plausible that smartphone-based support groups create a virtual environment open to sharing experiences and information and providing support to group members. Past research has found that patients tend to regard smartphone-based support groups as peer social networks or as means to receiving professional support (Fukuoka, Kamitani, Bonnet, & Lindgren, 2011). In fact, patients with chronic diseases have been known to request support groups to connect to other patients in smartphone-based interventions (Muessig et al., 2013). Considering the high needs and expectations of smartphone-based support groups among individuals with chronic illnesses, some intervention studies have used smartphone-based social networking platforms to help chronically ill patients overcome some of the challenges they face (McLaughlin et al., 2012; Song et al., 2012). They have found that smartphone-based support groups provide participants with emotional and informational support, and such support is particularly effective at fulfilling the needs going unmet in face-to-face settings (McLaughlin et al., 2012).

The Potential of Mobile Information and Communication Technologies (MICTs) to Manage Alcohol Addiction

Given that alcoholism is a chronic disease and acute treatment is just the beginning of caring alcoholism, it is very important to offer ongoing support for relapse prevention after patients with alcohol dependence complete residential treatment (McTavish et al., 2012; Johnson, Isham, Shah, & Gustafson, 2011). Previous research has found that prolonged participation in continuing care for alcohol and drug abusers is associated with better outcomes (McLellan,

McKay, Forman, Cacciola, & Kemp, 2005; Simpson, 2004; McKay, 2005). In other words, substance use disorders are often considered as chronic problems better managed by ongoing monitoring and extended services than by an acute treatment approach.

In this situation, mobile information and communication technologies (MICTs) show promise as an efficacious and cost-effective means of communicating health-behavior risks, improving public health outcomes, and accelerating behavior change (Abroms & Maibach, 2008). In particular, MICTs may play an important role in improving the effectiveness, cost-effectiveness, and reach of efforts to assess, prevent, treat, and support the recovery management of alcohol use disorders. MICTs exhibit a number of unique characteristics, which include connectivity, accessibility, reachability, portability, localization, and ubiquity (Junglas & Watson, 2003). Specifically, mobile connectivity is one of the fundamental aspects of MICTs. In comparison to the wired network environment, users are not constrained by the location and availability of network plug-ins. Thus, they can remain permanently connected anywhere. Accessibility and reachability refer to the capability of access to a wireless network at any place and any time. Portability is the ability to physically move computing and communications products and services with the user. Localization refers to the ability to locate the geographical position of a user or mobile device. It is particularly important when the user requires location-specific information. Lastly, ubiquity includes the integration of all the aforementioned characteristics. Thus, MICTs users have the capability to access the network at any place and any time, and be in touch, be reached, and located at any place and any time using always connected portable devices.

Based on these unique characteristics, mobile information and communication technologies (MICTs) can used to cost effectively complement and extend existing support

services for relapse prevention services to improve long-term outcomes for individuals struggling with alcohol dependence disorders (Gustafson, Shaw, et al., 2011). Specifically, MICTs can facilitate an ideal setting for identifying relapse or risk of relapse and offering brief treatment or referring to specialty treatment when needed. In particular, they can help individuals prevent lapse to substance use, at times when they are at greatest risk for use. MICTs can also function as clinician-extender because they can be utilized to provide much of the education and ongoing therapeutic support that patients with alcohol use disorders needs, allowing clinicians to focus on providing the primary care (Quanbeck et al., 2014).

On the other hand, research indicates that lack of actual and perceived positive social support or the existence of social pressure is associated with relapse vulnerability (Beattie & Longabaugh, 1999; Havassy, et al., 1991; Broome, Simpson, & Joe, 2002). In contrast, people in recovery who remain involved with support groups have superior abstinence outcomes (Dobkin et al., 2002; Ouimette et al., 2001; Ouimette, Moos, & Finney, 2003). Therefore, one effective way to prevent relapse is to help patients connect with others who can provide social support for coping with challenging issues in recovery from alcoholism. Mobile information and communication technologies (MICTs) can be used in several ways to improve the communication of social support to prevent relapse. They allow people in recovery to exchange social support one another through mobile support groups, text messaging, or e-mail. The portable and immediate communication properties of MICTs also provide a variety of ways to easily reach individuals such as health care providers or significant others. For example, recent developments of mobile computing devices such as smartphones, personal data assistants (PDAs), and tablet PCs permit individuals to talk with others anywhere and anytime. Therefore, addiction patients utilizing mobile computing devices can have more frequent and convenient

interactions with their networks of social support when they need helps. For these reasons, it is likely that MICTs promote supportive communication among patients with alcohol dependence and consequently, lead to improving their lives.

Chapter 4: Communicating Emotional Support in Smartphone-Based Alcoholism Support Groups

Four Types of Supportive Communication in Support Groups

A communicative approach to the study of social support recognizes that the exchange of social support is a symbolic and rhetorical process (Goldsmith & Fitch, 1997). Regarding the symbolic process, the effects of support reception do not come about mechanistically through the mere issuance of a supportive act. Rather, they are the result of participants' interpretations of acts. Regarding the rhetorical process, situations in which social support is communicated involve multiple goals and outcomes, and the beneficiaries of supportive communication are those who deploy discursive resources in ways that are adapted to these demands. In other words, social support is a communication behavior that involves informing, persuading, or teaching. It is specifically intended to improve the well-being of another person currently suffering from a stressful situation. Albrecht and Adelman (1987) argued that "social support refers to verbal and nonverbal communication between recipients and providers that helps manage uncertainty about the situation, the self, the other or the relationship and functions to enhance a perception of personal control in one's life experience" (p. 19). Thus, researching social support as a communication situation means studying the dynamic interactions in which people request, provide, and receive social support messages.

Given that social support is mainly exchanged through conversational interactions, supportive communication can be classified into three common types of behaviors. The first type of supportive communication is to seek or request social support. Seeking social support refers to the attempt to receive emotional and instrumental support from others (Hagger & Orbell, 2003). It is especially frequent among people with diseases viewed as stigmatizing (Davison,

Pennebaker, & Dickerson, 2000; B. R. Shaw et al., 2000). Previous research has documented the physical and psychological benefits of seeking social support. Heijmans (1998) found that seeking social support was positively related to the mental health of patients with chronic fatigue syndrome. Similarly, Drossman et al. (2000) found that seeking social support helped reduce psychological distress and dysfunction in persons with inflammatory bowel disease. Another study by Holland and Holahan (2003) found that seeking social support was positively associated with psychological well-being and healthy behaviors for women with breast cancer. Rothrock, Lutgendorf, and Kreder (2003) found that seeking instrumental support was associated with fewer depressive symptoms for patients with interstitial cystitis.

The second type of supportive communication is to give social support. The most important aim of supportive communication is to provide social support to others. Giving social support refers to the actual offering or conveying of supportive actions and behaviors – including emotional, informational, and/or instrumental support – that match the kind of support sought by a person facing life strain and stress (Nurullah, 2012). According to the helper therapy principle (Riessman, 1965), providing support is beneficial for both the support provider as well as the support receiver. This claim suggests that those giving social support are involved in the act of self-persuasion while they persuade or inform others. More specifically, a person providing social support feels more independent and less indebted that may be especially beneficial for people with chronic illnesses (Gleason, Iida, Bolger, & Shrout, 2003). For instance, the practice of helping others promotes support providers' personal control (Krause, Herzog, & Baker, 1992), self-esteem (Krause & Shaw, 2000; Schwartz & Sendor, 1999), and communication abilities (Mowbray, Moxley, Thrasher, Bybee, & Harris, 1996). In addition, giving support is an altruistic behavior that is an adaptive mental mechanism resulting in a mature psychological defense

(Vaillant, 2000). Thus, providing social support leads to several health benefits, such as improved mental health (Krause et al., 1992; Schwartz, Meisenhelder, Ma, & Reed, 2003; Schwartz & Sendor, 1999) and reduced mortality (S. L. Brown, Nesse, Vinokur, & Smith, 2003; McClellan, Stanwyck, & Anson, 1993). Brown et al. (2003) suggested the possibility of a process underlying the beneficial effects of giving social support, indicating that offering social support may improve health through its association factors that reduce the deleterious impacts of negative emotion. Supporting this suggestion, Warner et al. (2010) found that providing social support was positively associated with self-esteem and control beliefs, which resulted in higher physical and mental quality of life.

The last type of supportive communication is to receive social support. Receiving social support has been the main target of investigation by social support literature (Dunkel-Schetter & Bennett, 1990; Thoits, 1995). Receiving social support refers to the reception of emotional, informational, and instrumental support from close confidants or others, such as family members, friends, or colleagues (Schulz & Schwarzer, 2004). More specifically, Nurullah (2012) defined the reception of social support as "the experience of receiving actions and behavior that are considered supportive by the recipient in fostering emotional, instrumental, informational, appraisal, and companionship needs, which match the types of support sought by the recipient with ones that are provided by close relations and significant others in an effort to improve well-being and effectively deal with life crisis" (p. 174).

Although receiving social support is generally considered to be beneficial in people with chronic diseases (Luszczynska, Mohamed, & Schwarzer, 2005; Luszczynska, Sarkar, & Knoll, 2007), it does not always result in benefits (S. L. Brown et al., 2003). Previous research has demonstrated that receiving social support is often harmful in some cases (S. L. Brown &

Vinokur, 2003; Hays, Saunders, Flint, Kaplan, & Blazer, 1997; Seeman, Bruce, & McAvay, 1996). A possible rationale for these negative findings may be that the source of social support is an important determinant of how effectively it is received. Patients can receive social support from various sources, including family members, friends, health care professionals, or fellow patients. Therefore, it might be assumed that different results are associated with the different sources of social support (Luszczynska, Pawlowska, Cieslak, Knoll, & Scholz, 2013). Previous research found that receiving support from family and friends was positively related to cancer patients' emotional quality of life (Boehmer, Luszczynska, & Schwarzer, 2007), whereas receiving support from health care professionals was particularly helpful in attenuating their physical symptoms (E. Thompson, Solà, & Subirana, 2005). Accordingly, social support research on health must explore the varied nature of those who provide social support (Wellman & Gulia, 1999).

In general, social support groups have two main sources of support: (1) peer patients and (2) health care providers. Individuals with similar health problems are well situated to empathize with one another and may thus be a valuable source for social support (B. R. Shaw et al., 2000; Wright, 2002). In other words, communication with others who are suffering, or have suffered, from a specific health condition offers a multitude of potential opportunities to receive information, emotional, and instrumental support (Rains & Young, 2009). Another important source of support for chronically ill patients includes health care providers. They are willing to provide emotional support by talking emphatically about patients' fears and worries (Dunkel-Schetter, 1984; Kristiansen, Tjørnhøj-Thomsen, & Krasnik, 2010; Mello, Tan, Armstrong, Sanford Schwartz, & Hornik, 2013). In addition to being positioned as emotional support providers, they are particularly reliable sources of informational support for people with chronic

illnesses (Arora, Finney Rutten, Gustafson, Moser, & Hawkins, 2007; Koutsopoulou, Papathanassoglou, Katapodi, & Patiraki, 2010).

Undoubtedly, peer patients and health care providers can play a critical role as different sources of support in support groups for people with chronic diseases. Thus, the reception of social support should be divided into two additional types of supportive communication: (1) receiving social support from peer patients and (2) receiving social support from health care providers.

Testing Three Models of Communicating Emotional Support

Due to physical disabilities, remoteness of location, restricted mobility and access to public transport, face-to-face supportive communication may not so easily occur among people with chronic health conditions (Braithwaite et al., 1999; Finn, 1999; Lieberman & Goldstein, 2005). For these individuals, what has emerged as a particularly attractive and beneficial alternative is to communicate social support online. There is ample evidence that social support is actively communicated in online support groups for a variety of chronic diseases, such as eating disorders (Winzelberg, 1997) and disabilities (Braithwaite et al., 1999), irritable bowel syndrome (Coulson, 2005), Huntington's disease (Coulson et al., 2007), HIV/AIDS (Mo & Coulson, 2008), eating disorders (Eichhorn, 2008), and amyotrophic lateral sclerosis (Loane & D'Alessandro, 2013).

Given that online communication is a primary way that individuals seek, give, and receive social support in virtual communities, how to communicate social support online can be categorized into two message-relevant behaviors: message expression (writing) and reception (reading). The rapid ascension of interaction communication technologies has led to the

emergence of a message expression-effects paradigm. The bidirectional nature of online communication highlights that the messages individuals construct and deliver to others may have just as important implications as the messages they receive (Nekmat, 2012). Applying this classification to the communication of online social support, we can specify four types of supportive communication in the context of support groups. From a message expression-effects paradigm, seeking social support refers to the behavior of writing messages to request social support. Likewise, giving social support is the behavior of writing messages to offer social support. From a message reception-effects perspective, receiving social support from peer patients is the act of reading messages that peer patients provide for social support. Similarly, receiving social support from health care providers is the act of reading messages that health care providers offer for social support.

Model I: Prediction model of communicating emotional support. Communicating emotional support has become a common activity within online support groups for individuals with alcohol addiction problems (Chuang & Yang, 2010, 2012a, 2012b; Coulson, 2014; Cunningham et al., 2008; Finfgeld-Connett, 2009). Yet, relatively little is known about the factors affecting such communication behaviors, including seeking, giving, and receiving emotional support from peer patients or health care providers.

Given that communicating emotional support is considered to one of the vital behaviors in online support groups, we can apply Johnson's (1997) comprehensive model of information seeking (CMIS) in explaining the antecedents to giving, seeking, and receiving emotional support in online support groups, specifically, smartphone-based support groups for people with alcohol use disorders. The CMIS draws concepts and findings from a synthesis of three large

theoretical traditions that incorporate uses and gratification research, the health belief model, and a model of media exposure and appraisal (D. J. Johnson, 1997). Using the CMIS framework, previous research has examined what factors predict different types of participations in online support groups for individuals with chronic diseases (Han et al., 2012; Han et al., 2010; E. Kim et al., 2011; B. R. Shaw, Hawkins, Arora, et al., 2006; Yoo et al., 2013). In most of these studies, the following three predictors were found to be significant: (1) sociodemographic backgrounds, (2) treatment and disease-related information, and (3) psychosocial characteristics.

Sociodemographic backgrounds. Sociodemographic characteristics are recognized as essential factors in predicting the communication of social support in online support groups. A strong predictor of participation in online support groups is a youthful age. Younger patients tend to report unmet needs with regard to information and psychological support (Zebrack, 2008; Zebrack et al., 2013). In addition, younger patients are more trusting of the Internet than are older patients. Previous research found that younger patients were more likely to participate in online patient support groups (Dutta & Feng, 2007; Han et al., 2010; Mo & Coulson, 2010; Van Uden-Kraan et al., 2011). Given the high levels of motivation and participation in online support groups, younger patients may be more inclined to communicate emotional support in the support groups.

Gender is also an important factor in predicting the communication of social support in online support groups. In general, women are substantially more likely than men to provide support (House, Umberson, & Landis, 1988) and women have a greater tendency to seek social support (Thoits, 1995). In particular, they are more likely to be involved in the exchange of emotional support outside their family than are men (Barbee et al., 1993; Liebler & Sandefur,

2002). Additionally, women typically have a large network of individuals who they can confide in and turn to for social support when faced with health problems. Men tend to rely exclusively on their partner as their sole source of emotional support (Harrison, Maguire, & Pitceathly, 1995). For these reasons, female patients have been found to outnumber male patients in many patient support groups (Cella & Yellen, 1993; Krizek, Roberts, Ragan, Ferrara, & Lord, 1999; Van Uden-Kraan, Drossaert, Taal, Seydel, & van de Laar, 2009; Van Uden-Kraan et al., 2011). Thus, women patients would be more likely to participate in online support groups for exchanging emotional support.

Race and education level influence the communication of social support in online support groups. For example, African Americans have more collectivistic belief systems than do White Americans (Pyke & Bengtson, 1996; Triandis, 2001). The more collectivistic beliefs may lead African Americans to engage in family support more frequently. They may be hesitant to talk for social support with people outside the family. Prior studies found that African American patients participated less in online support groups than did White American patients (Han et al., 2010; E. Kim et al., 2011; B. R. Shaw, Hawkins, Arora, et al., 2006). As for education level, previous research found that patients with higher levels of education were more likely to attend support groups (Deans, Bennett-Emslie, Weir, Smith, & Kaye, 1988; Taylor, Falke, Shoptaw, & Lichtman, 1986) and had greater interest in support group participation (Bui et al., 2002). Similarly, Van Uden-Kraan et al. (2009) found that the majority of patient participants in online support groups had a medium or high level of education. Patients with higher education may thus be more likely to exchange emotional support in online support groups.

The communication of online social support is significantly affected by living and employment situations. According to the convoy model of social support (Kahn & Antonucci,

1980), each individual is surrounded by a convoy, a set of people to whom the individual exchanges emotional and instrumental support. These are all the ways in which the size and composition of a person's social network may be expanded, and/or they are mechanisms that increase contact among network members. In other words, as the levels of formal and informal social networks increase, individuals can come into contact with more sources for communicating social support. In contrast, the lack of such social networks can lead to participation in support groups as an alternative way of communicating social support. For example, compared to chronically ill patients who live with a spouse or with family members, those who live alone feel more lonely, hopeless, and helpless (Akechi, Okamura, Yamawaki, & Uchitomi, 1998) and have lower social support (T. Thompson, Rodebaugh, Pérez, Schootman, & Jeffe, 2013). Under such conditions, they may be more likely to exchange online social support with others. In contrast, married people may be less likely than unmarried or divorced people to get involved in such exchanges since married people can rely on their spouses for such support (Liebler & Sandefur, 2002). On the other hand, unemployed patients may be more likely to participate in online support groups because they experience a lack of a social network and thus have a high need for social interaction (Sautier, Mehnert, Höcker, & Schilling, 2014). Supporting this argument, Van Uden-Kraan et al. (2009) found that most participants of online support groups were unemployed or unable to work. Therefore, living with someone and being employed could be seen as an important determinant of communicating emotional support in online patient support groups.

Treatment and disease-related information. Patients with chronic illnesses, including alcohol use disorders, may encounter different needs for social support before, during, and after

treatment. For example, in preparing for treatment, patients may prefer information about the nature of their illnesses, chances of cure, or treatment options; information about managing side effects during treatment; and information about self-management, follow-up care, and long-term adverse effects after treatment (D. J. Johnson, 1997; Raupach & Hiller, 2002; Rutten, Arora, Bakos, Aziz, & Rowland, 2005). Empirical evidence indicates that patients undergoing treatment are significantly more likely to have physical and daily living support needs than are patients who have completed treatment (Cockle-Hearne et al., 2013). These patients also do not express unmet needs for support after treatment (Armes et al., 2009). Therefore, the level of engagement within online patient support groups can differ in terms of the stage of treatment in a patient. For instance, it is likely that communicating emotional support may appear to be highest and most varied during active treatment times.

In addition, the disease state can play an important role in predicting the communication of social support in online patient support groups. Building on the elaboration likelihood model (ELM), the motivation-driven framework suggests that extrinsic health motivation drives online health community use (Dutta & Feng, 2007). This motivation is not only dispositional but may be triggered by external factors (Petty & Cacioppo, 1984, 1986a; Zaichkowsky, 1985). In the realm of online patient support groups, disease-related factors may influence the motivation to participate in the groups. Specifically, a patient in a specific disease condition is more likely to seek out information related to the disease and participate in the disease support groups. Past research found that patients with chronic diseases were more likely to use online patient communities than were individuals not diagnosed with chronic diseases (Dutta & Feng, 2007; Mo & Coulson, 2010). Moreover, the incidence or severity of illness was found to trigger active engagement in online patient support groups (Han et al., 2010). Given that the stage of disease

affects needs for social support (B. R. Shaw et al., 2008), patients with a long-term and severe disease may be more likely to communicate emotional support within online support groups to secure social support related to the disease.

Psychosocial characteristics. Social support networks have a powerful impact on how patients cope with their diseases as they serve as resources for exchanging social support. Patients who lack such social support networks may need to seek alternative support resources, such as online support groups. In other words, low levels of social support perception may turn to online support communities and engage more in order to compensate for the lack of those resources (B. R. Shaw et al., 2008). Previous research found that patients who perceived a lack of available social support were more likely to post and/or read messages in online cancer support groups (Han et al., 2012; E. Kim et al., 2011). Thus, it is reasonable to assume that patients with lower perceptions of support availability may be more likely to communicate emotional support in online support groups.

Risk preference may influence the supportive communication in addiction support groups that help patients sustain their recovery from alcoholism. This personality trait is of obvious relevance to several health risky behaviors, including smoking, alcohol, and drug abuse (Zuckerman & Kuhlman, 2000). Thus, high risk takers living with drinking problems are less likely to have interest on information or advice for preventing relapse in alcohol use, which is a typical form of health risk behaviors. Because their support needs are relatively low, they may lose the motivation to participate in online alcoholism support groups. As a result, risk preference may inhibit the opportunity for supportive communication in the groups.

As mentioned earlier, the first purpose of this dissertation is to investigate what people actually engage in emotional support communication within smartphone-based support groups for individuals with alcohol use disorders. Drawing upon the literature review and empirical evidence about potential predictors of communicating emotional support, this study poses three groups of determinants of giving, seeking, and receiving emotional support: (1) sociodemographic backgrounds, (2) treatment and addiction-related information, and (3) psychosocial characteristics. Although there is clearly extent research to recognize the effects of these factors on the communication of online social support, the direction of each influence is unclear and inconsistent. Therefore, the following research questions are posed.

Research Question 1 (RQ1): What is the relationship between sociodemographic backgrounds and communicating emotional support?

Research Question 1a (RQ1a): What is the relationship between sociodemographic backgrounds and seeking emotional support?

Research Question 1b (RQ1b): What is the relationship between sociodemographic backgrounds and giving emotional support?

Research Question 1c (RQ1c): What is the relationship between sociodemographic backgrounds and receiving emotional support from peer patients?

Research Question 1d (RQ1d): What is the relationship between sociodemographic backgrounds and receiving emotional support from health care providers?

Research Question 2 (RQ2): What is the relationship between treatment/addiction-related information and communicating emotional support?

Research Question 2a (RQ2a): What is the relationship between treatment/addiction-related information and seeking emotional support?

Research Question 2b (RQ2b): What is the relationship between treatment/addiction-related information and giving emotional support?

Research Question 2c (RQ2c): What is the relationship between treatment/addiction-related information and receiving emotional support from peer patients?

Research Question 2d (RQ2d): What is the relationship between treatment/addiction-related information and receiving emotional support from health care providers?

Research Question 3 (RQ3): What is the relationship between psychosocial characteristics and communicating emotional support?

Research Question 3a (RQ3a): What is the relationship between psychosocial characteristics and seeking emotional support?

Research Question 3b (RQ3b): What is the relationship between psychosocial characteristics and giving emotional support?

Research Question 3c (RQ3c): What is the relationship between psychosocial characteristics and receiving emotional support from peer patients?

Research Question 3d (RQ3d): What is the relationship between psychosocial characteristics and receiving emotional support from health care providers?

Model II: Direct and stress-buffering models of communicating emotional support.

From a message expression-effects paradigm, the construction of social support messages can produce several health benefits for patients with chronic health conditions. The number of chronically ill patients who seek social support online has steadily increased and the messages to seek social support thus compose the vast majority of messages expressed in online support groups for chronic illnesses (Bender, Jimenez-Marroquin, & Jadad, 2011; Greene et al., 2011; Ybarra & Suman, 2006). However, little is known about the benefits of seeking social support in online support groups. Online support seekers may avail themselves of a variety of support resources opportunistically by asking or providing information as their information needs come up (Walther, Pingree, Hawkins, & Buller, 2005). Thus, it may be reasonable to predict the effect of seeking social support on the health outcomes of patients with chronic health conditions. In practice, seeking social support in online health communities has been found to affect patients' decision making (Nambisan, 2011).

Recent research has shown an increased interest in taking into account the health-related benefits of the provision of emotional support in online support groups. For example, Han et al. (2011) found that providing emotional support within online breast cancer support groups was associated with fewer breast cancer-related concerns. Moreover, the reduction of breast cancer-related concerns resulting from giving emotional support was more pronounced among those who had a higher level of breast cancer-related concerns at baseline than those who did not. Kim et al. (2012) found that breast cancer patients who posted higher levels of emotional support messages in online support groups were more likely to reframe their own problems in a positive direction. The psychological benefits of giving emotional support messages were dependent on the level of emotional communication competence, suggesting that offering emotional support

had a positive impact on psychological quality of life for breast cancer patients who had higher levels of emotional communication competence, whereas it had a negative influence on the same outcome for those who had lower levels of emotional communication competence (Yoo et al., 2014).

According to a message reception-effects paradigm, the reception of social support in online support groups may result in a range of health benefits by addressing the fear, anger, and depression or fulfilling the need for advice or guidance concerning possible solutions to a problem. In line with this expectation, Kim et al. (2012) found that patients who received higher levels of emotional support had fewer breast cancer-related concerns in online breast cancer support groups. In addition, van Uden-Kraan et al. (2008) found that informational support provided by other participants of online support groups improved patients' confidence about their treatments for breast cancer, arthritis, or fibromyalgia. However, the reception effects of social support were often found to be conditional in terms of individual differences. Namkoong et al. (2010) found that when patients with higher health self-efficacy read treatment information in an online support group they experienced benefits to their emotional well-being; the result was the opposite for those with lower health self-efficacy. More recently, Yoo and colleagues (2014) found that the psychological benefit of receiving computer-mediated emotional support were contingent on emotional communication competence. That is, the reception of emotional support messages reduced breast cancer-related concerns for patients with higher levels of emotional communication competence, while it increased such concerns for those with lower levels of emotional communication competence.

In light of several benefits of expressing and receiving social support in online support groups, it is assumed that patients benefit from seeking, giving, and/or receiving emotional

support in smartphone-based alcoholism support groups. For theoretical underpinnings of the roles of communicating emotional support for alcoholism treatment, this dissertation employs two traditional frameworks of social support: (1) direct model and (2) stress-buffering model. The direct model of social support asserts that social support produces generalized positive outcomes for individuals regardless of the level of stressful life events. From this perspective, there is substantial evidence to prove a linkage between social support and alcoholism treatment outcomes (Beattie & Longabaugh, 1999; Booth, Russell, et al., 1992; Humphreys et al., 1995; Macdonald, 1987; Rosenberg, 1983). In a similar vein, communicating emotional support in smartphone-based alcoholism support groups is expected to have direct relationships on alcoholism treatment outcomes. For example, giving esteem support may encourage individuals with alcohol use disorders to cope with their addiction problems. In other words, the praise of relevant others and positive social comparison with similar others can be effective in enhancing patients' feelings of alcohol abstinence self-efficacy or increasing the importance of attempting to protect them from alcohol relapse. On the basis of the theoretical considerations on the direct relationship between communicating emotional support and the treatment outcome (i.e., risky drinking days) of alcohol use disorders, the present study proposes the following hypotheses.

Hypothesis 1 (H1): Communicating emotional support will be negatively associated with risky drinking days.

Hypothesis 1a (H1a): Seeking emotional support will be negatively associated with risky drinking days.

Hypothesis 1b (H1b): Giving emotional support will be negatively associated with risky drinking days.

Hypothesis 1c (H1c): Receiving emotional support from peer patients will be negatively associated with risky drinking days.

Hypothesis 1d (H1d): Receiving emotional support from health care providers will be negatively associated with risky drinking days.

The stress-buffering model of social support suggests that social support moderates the deleterious effect of high levels of stress (S. Cohen, Gottlieb, & Underwood, 2000; S. Cohen & Wills, 1985). Social support has been found to improve outcomes in a variety of settings by buffering the effect of stress (S. Cohen & Hoberman, 1983; S. Cohen, Sherrod, & Clark, 1986; S. Cohen & Wills, 1985; Henderson, 1981). The stress-buffering role of social support has also been documented in the context of alcohol involvement, such that the impact of stress on alcohol consumption is reduced in the presence of high levels of social support (K. A. Johnson & Jennison, 1994; Measelle, Stice, & Springer, 2006; Peirce, Frone, Russell, & Cooper, 1996; Steptoe, Wardle, Pollard, Canaan, & Davies, 1996). In other words, social support protects people with alcohol use disorders from stress-motivated drinking, such that it moderates the relationship between emotional distress and alcohol involvement.

Adopting this perspective in supportive communication within smartphone-based alcoholism support groups, communicating emotional support may function as a protective factor for alcohol involvement resulted from emotional distress. Alcoholic patients with negative emotions may be less likely to turn to alcohol consumption if they communicate greater emotional support in alcohol-related online communities. The stress-buffering model explains how exposure to stressful life events increases the likelihood of engaging in alcohol involvement and the extent to which this process is offset by the communication of emotional support. For

example, communicating emotional support can help reduce emotional stress-induced alcohol consumption by improving alcohol patients' feelings of control and self-esteem which are very important in the resistance to and recovery from alcoholism. The supportive communication makes people with alcohol use disorders feel that they are accepted and valued in their social networks and thus they may be likely to feel greater esteem, confidence, and efficacy related to alcohol abstinence. Additionally, communicating emotional support increases feelings of belonging that are necessary for a normal and healthy life. The sense of belonging provided by some social support systems is particularly important in preventing psychological disorders (Hagerty & Williams, 1999; Hagerty, Williams, Coyne, & Early, 1996). Thus, the feelings of belonging increased by communicating emotional support can reduce or hinder the stimulating influence of emotional distress on alcohol involvement. It is plausible to predict that communicating emotional support will buffer the impact of psychological distress on heavy drinking among people with alcohol dependence. Accordingly, the current research proposes the following hypotheses.

Hypothesis 2 (H2): Communicating emotional support will moderate the positive relationship between emotional distress and risky drinking days, such that this positive association will be weaker for patients who communicate more emotional support.

Hypothesis 2a (H2a): Seeking emotional support will moderate the positive relationship between emotional distress and risky drinking days, such that this positive association will be weaker for patients who seek more emotional support.

Hypothesis 2b (H2b): Giving emotional support will moderate the positive relationship between emotional distress and risky drinking days, such that this positive association will be weaker for patients who give more emotional support.

Hypothesis 2c (H2c): Receiving emotional support from peer patients will moderate the positive relationship between emotional distress and risky drinking days, such that this positive association will be weaker for patients who receive more emotional support from peer patients.

Hypothesis 2d (H2d): Receiving emotional support from health care providers will moderate the positive relationship between emotional distress and risky drinking days, such that this positive association will be weaker for patients who receive more emotional support from health care providers.

Model III: Mediation model of coping strategies. Researchers have explored extensively the various benefits of communicating emotional support in online support groups. However, there is less understanding of the mechanism through which the communication of emotional support is related to outcomes. Theoretically, some scholars have posited several mechanisms through social support may be associated with physical or psychological well-being (S. Cohen, 1988; Thoits, 1986; Wills, 1990). According to stress and coping theories, social support helps an individual better cope with problems (Thoits, 1986; Wills, 1985; Wills & Filer, 1996). That is, coping strategies are assumed to be implicated in the causal process that social support exerts its effects.

Coping refers “cognitive and behavioral efforts made to master, tolerate, or reduce external and internal demands and conflict” (Folkman & Lazarus, 1980, p. 223). An individual in

a stressful situation makes a cognitive appraisal of the significance of the event in terms of his or her well-being as well as the coping options available (Holland & Holahan, 2003). In this regard, coping strategies can play a very important role in recovering from addictive behaviors, including alcohol use disorders. According to social learning theory (Bandura, 1977), cognitive-behavioral coping skills contribute to stable remission. For example, making general lifestyle changes helps alcoholics maintain sobriety by providing more positive and fewer conflictual interactions (Monti, Kadden, Rohsenow, Cooney, & Abrams, 2002). Several cognitive-behavioral coping strategies have been significantly related to better alcohol-related outcomes. Previous studies found that more positive thinking and greater use of distraction led to alcohol abstinence (Litman, 1986; Litman, Eiser, Rawson, & Oppenheim, 1979; Litman, Stapleton, Oppenheim, Peleg, & Jackson, 1984; Maisto, Connors, & Zywiak, 2000; Miller, Westerberg, Harris, & Tonigan, 1996). Similarly, other studies found that reliance on approach coping (cognitive and behavioral responses directed toward resolving a stressor) predicted more abstinence and fewer alcohol-related problems (T. Chung, Langenbucher, Labouvie, Pandina, & Moos, 2001; Moggi, Ouimette, Moos, & Finney, 1999; Moos & Moos, 2007). In contrast, avoidance coping (cognitive and behavioral responses directed toward minimizing a stressor and reducing the distress associated with it) was found to predict higher levels of alcohol use and more drinking problems (Carpenter & Hasin, 1999; Holahan, Moos, Holahan, Cronkite, & Randall, 2003). On the other hand, relapse prevention theory (Marlatt & Gordon, 1985) asserts that situation-specific coping strategies help people with alcohol dependence govern alcohol use. In support of this suggestion, previous research found that thinking about the positive consequences of staying sober or the negative consequences of returning to drinking led to reduced alcohol use after treatment (Monti & Rohsenow, 2003; Monti et al., 1993; Rohsenow et

al., 2001). A recent study found that both general lifestyle and situation-specific coping strategies were related to greater alcohol abstinence and/or less frequent alcohol drinking (Dolan, Rohsenow, Martin, & Monti, 2013).

As discussed above, coping strategies are a significant predictor of treatment outcomes for alcohol dependence. Given that coping is a process of state that can be affected over time by external factors (Lazarus, 1993), social support can work as coping assistance (O'Brien & DeLongis, 1997; Thoits, 1986). In other words, social support can improve and enhance coping strategies with a health problem through tangible or information aid, as well as through enhancement of self-esteem and self-confidence that bolster one's courage to face the problem (Holahan, Moos, & Bonin, 1997; Schaefer, Coyne, & Lazarus, 1981). Thus, it is assumed that social support promotes patients' use of healthy coping strategies, which eventually leads to better health outcomes. This perspective is consistent with the theoretical position that enhancement of coping skills is an important mechanism through which social support contributes to improving physical or mental health (Thoits, 1986; Wills, Blechman, & McNamara, 1996). Previous research found that social support increased the adoption of coping strategies, which in turn enhanced emotional well-being among people with chronic health conditions (Holahan, Moos, Holahan, & Brennan, 1995; Holland & Holahan, 2003; J. Kim, Han, Shaw, McTavish, & Gustafson, 2010).

In the context of addictive behaviors, the effect of social support has been mediated by coping strategies. Wills and Cleary (1996) found that emotional and informational support from parents predicted a greater use of behavioral coping strategies, which in turn resulted in less adolescent substance use. Similarly, Humphreys, Mankowski, Moos, and Finney (1999) found that participation in mutual support groups was associated with increases in active coping

responses, leading in turn to less substance abuse. Two recent studies found that the effects of participation and communication in online support groups were mediated by the group participants' perceived bonding (Namkoong et al., 2012; Namkoong et al., 2014).

In light of an extensive literature review on the mediating role of coping strategies between social support and drinking behaviors, this study proposes a mediation model where communicating emotional support influences alcoholic patients' excessive alcohol consumption by motivating the patients to perform coping strategies. Specifically, the current research predicts that the performance of coping strategies will be influenced by seeking, giving, and receiving emotional support in smartphone-based alcoholism support groups. The predicted influence will in turn result in reduced risky drinking days. Thus, the following hypotheses are posed.

Hypothesis 3 (H3): Coping strategies will mediate the negative relationship between communicating emotional support and risky drinking days.

Hypothesis 3a (H3a): Seeking emotional support will be negatively related to risky drinking days through coping strategies.

Hypothesis 3b (H3b): Giving emotional support will be negatively related to risky drinking days through coping strategies.

Hypothesis 3c (H3c): Receiving emotional support from peer patients will be negatively related to risky drinking days through coping strategies.

Hypothesis 3d (H3d): Receiving emotional support from health care providers will be negatively related to risky drinking days through coping strategies.

Chapter 5: Methodology

Addiction-Comprehensive Health Enhancement Support System (A-CHESS)

The Comprehensive Health Enhancement Support System (CHESS), developed at the University of Wisconsin-Madison, is the best-known and most widely tested, interactive health communication system (IHCS) for health education and support. IHCS helps bridge the communication gaps that occur among patients, family, and clinicians. It also facilitates the empowering of each party to actively engage in disease care and to share in the decision making (DuBenske, Gustafson, Shaw, & Cleary, 2010). As a non-commercial IHCS, CHESS generally employs information and communication technologies (ICTs) to provide users with information, strategies that promote behavior change, tools for decision making, and access to support services. There is a growing body of evidence, indicating that CHESS has contributed to significant improvements in quality of life, participation in health care decisions, and effective use of health care services for those facing life-threatening diseases such as cancer, HIV, and coronary artery illness (Gustafson et al., 2002; Gustafson et al., 1999; Gustafson et al., 2008; Gustafson et al., 2001).

However, the previous CHESS program was typically a desktop-based IHCS. For the newest generation, the University of Wisconsin's Center for Health Enhancement Systems Studies launched a smartphone-based, relapse-prevention program called Addiction-Comprehensive Health Enhancement Support System (A-CHESS). The purpose of this program is to help individuals manage addiction problems, including alcohol use disorders (Chih et al., 2014; Gustafson et al., 2014; McTavish et al., 2012). The recent dramatic increase in smartphone capabilities has expanded the role of information and communication technologies (ICTs) in the management of addictive behaviors. Extending the reach of what can be assessed and provided,

these smartphones integrate such technological features as global positioning systems (GPS), text messaging, and cameras (Gustafson, Boyle, et al., 2011). A-CHESS was thus designed to improve the management and continuing care of alcohol use disorders by offering various services at almost any time and place (Gustafson, Shaw, et al., 2011). The services of A-CHESS were created and included based on self-determination theory (SDT) and Marlatt's cognitive behavioral relapse prevention model. SDT asserts that an individual is more able to adhere to self-care activities when the individual satisfies three fundamental needs: (1) perceived competence, (2) a feeling of relatedness, and (3) autonomous motivation (Deci & Ryan, 2000; R. M. Ryan & Deci, 2000). In other words, the patient's regulation of health-related behavior is better maintained by satisfying the three basic psychological needs for competence, relatedness, and autonomy (R. M. Ryan, Patrick, Deci, & Williams, 2008). The three psychological needs are also related to immediate determinants (high-risk situations, lack of coping response, low self-efficacy, and abstinence violation effects) and covert antecedents (lifestyle imbalances, urges, and cravings) of relapse in Marlatt's model. The model suggests that the interventions need to include both specific strategies (e.g., identifying high-risk situations and increasing the use of coping) and general (e.g., balancing lifestyle, pursuing positive, and rewarding activities) strategies to address each of the determinants of relapse (Gustafson, Shaw, et al., 2011; McTavish et al., 2012).

Building on both SDT and Marlatt's model, A-CHESS offers a wide range of services to prevent relapse in alcohol dependent patients. For example, people with alcohol use disorders can exchange information and support with other A-CHESS users and counselors via "Discussion Groups." "Ask an Expert" allows A-CHESS users to receive responses within 24 hours from alcohol addiction experts, in addition to enabling them to request information and

advices. “Personal Stories” offers professionally written as well as video interviews of patients and caregivers focused on addressing strategies to overcome barriers to alcohol addiction management. “Instant Library” provides summaries of key articles and chapters, and manuals on alcohol use disorders. “Medication Resources” includes information about alcohol addiction pharmacotherapies, side effects, and ways to reduce barriers to adherence. “Questions and Answers” offers brief answers to hundreds of questions about alcoholism, with links to other A-CHESS services that provide more detail. “Web Link” enables patients to access recommended addiction-related Web sites, with information on the sites’ strengths and weakness. “Easing Distress” is a computerized cognitive behavior therapy program to help patients cope with thoughts detrimental to efforts at preventing relapse by providing practical exercise and relaxation. Using the smartphone’s GPS, “Location Tracking” initiates rescue when the patient approaches a high-risk location. GPS also provides maps for nearby meetings of Alcoholics Anonymous (AA) and treatment providers in emergency situations. “Reminders” provides timely text and audio reminders of medications, significant milestones, reasons for quitting, and inspirational messages. “Healthy Event Newsletter” informs patients about healthy events. “Care Manager” helps patients avoid the relapses that are common with alcohol-dependence disorders by using one-on-one counseling via a pre-programmed button on their phones (see Table 1).

Table 1

A-CHESS Services

Main services	Description
Discussion Groups	Participants can anonymously exchange emotional support and information with other A-CHESS users via online bulletin-board support groups.
Ask an Expert	Allows A-CHESS users to receive personal responses to their questions from experts in addiction within 48 hours.
Open Expert	Responses to questions sent to Ask an Expert that are of general interest are rendered anonymous and made available for all users to view.
Personal Stories	Professionally produced text and video accounts of recovery experiences based on interviews of patients and family members. Stories focus on ways to overcome barriers to addiction management as well as how to make different choices and cope with challenges.
Instant Library	Detailed summaries of articles, chapters, and manuals on addiction management.
Medication Resources	Information about addiction pharmacotherapies, side effects, and ways to reduce barriers to adherence (e.g., forgetting to take medications, daily techniques to remember to take medications).
Frequently Asked Questions	Brief answers to frequently asked questions about addiction, such as "Why do some people become addicted to drugs, while others don't?" and "How do I deal with cravings for alcohol?" Links to additional CHESS services offering more detailed information and support are also provided.
Web Links	Patients access approved addiction-related web sites (and specific pages within sites).
Easing Distress	A computerized cognitive-behavior therapy program designed to help people cope with harmful thoughts that can stymie efforts to prevent relapse. It helps assess logical errors, attributional style, and the tendency to exaggerate distress, and offers practical exercises to improve cognitive problem-solving skills.
Healthy Events Newsletter	Alerts the person in recovery about healthy drug- and alcohol-free events taking place in their city.

Table 1

A-CHESS Services (continued)

Main services	Description
High-Risk Patient Locator	Global positioning system (GPS) technology tracks when participants approach an area where they traditionally obtained or consumed alcohol so they can receive "just-in-time" support to work through what might be a high risk situation for relapse. To activate, individuals voluntarily register places where they regularly obtained or consumed alcohol in the past and now designate as high-risk locations for relapse.
Daily Thoughts	Motivational quotes (usually about sobriety) sent via text messaging each morning to A-CHESS participants.
Sobriety Counter	Appears on the home page of A-CHESS to remind participants of how many days they have been sober.
Panic Button	Provides immediate help to avoid an imminent relapse (e.g., if urges and cravings become severe and help is desired). By pressing the PANIC BUTTON an intervention (set up during training) would start, including automated reminders to the patient (personal motivations for not drinking), computer-generated alerts to key people (e.g., counselor, sponsor, counselor, family) who may reach out to the patient via phone or in person, and specific tools for dealing with urges.
Weekly Check-In	Brief survey (Brief Alcohol Monitoring Index) to obtain patient data on negative affect, lifestyle balance, and recent substance use. Check-in information is used by A-CHESS for triage and feedback. Patients' care managers are automatically notified if a participant score exceeds a predetermined threshold. The care manager can view a summary report of Check-in data if they wish.

Note. From "How patients recovering from alcoholism use a smartphone intervention" by McTavish et al., 2012, *Journal of Dual Diagnosis, 8*(4), p. 298.

Participants and Procedure of A-CHESS Study

For this dissertation, subjects and data were originally collected as part of an A-CHESS study that was a randomized controlled trial with 349 patients. Patients had to meet the criteria for DSM-IV alcohol dependence on entering treatment at three residential programs operated by a nonprofit treatment organization in the Midwest and two programs operated by another

nonprofit organization in the Northeast. Onsite project coordinators employed by each program identified eligible patients from the program's administrative database. Participants had to be at least 18 years old, willing to be randomized, and provide two backup contacts for follow-up. Patients were excluded if they had vision problems, a history of suicidality, or a significant development or cognitive impairment that would limit their ability to use A-CHESS. Approximately two weeks before an eligible patient left residential treatment, the project coordinator would introduce them to the study's purpose and explain its procedure, the benefits and risks of study participation, participants' responsibilities, and the method of data collection. If participants agreed to participate in the study, they signed a written consent and completed a pretest. In addition, the study included three posttest surveys at 4, 8, and 12 months following the intervention's initiation.

As shown in Figure 1, a total of 380 patients were originally recruited for the A-CHESS study from February 11, 2010 through June 30, 2011. Among them, 13 patients were identified as ineligible and 18 declined out of lack of interest, unwillingness to use a smartphone with GPS, or because they failed to attend their scheduled intake meeting. Of the 349 patients who actually participated in the study, 179 were randomized to the control group and 170 were randomized to the intervention group. Patients in the control group received treatment as usual for the intervention period, whereas those in the A-CHESS intervention group received treatment as usual plus a smartphone replete with the A-CHESS application, mobile phone services, and a data plan. While still in the residential treatment facility, study participants randomized to the A-CHESS group learned and practiced using A-CHESS services under counselor guidance. Before leaving residential treatment, participants were required to demonstrate a minimal understanding of A-CHESS (i.e., the ability to set up their profile and use the discussion board and texting

features) and to have entered a minimum of two people to be contacted in case they pressed the application's panic button. Participants were provided a toll-free number to call if they had any questions about the study or the A-CHESS services as well as the dates of their follow-up surveys. They were free to use the smartphones for personal purposes during the intervention period, but only the use of A-CHESS services was monitored.

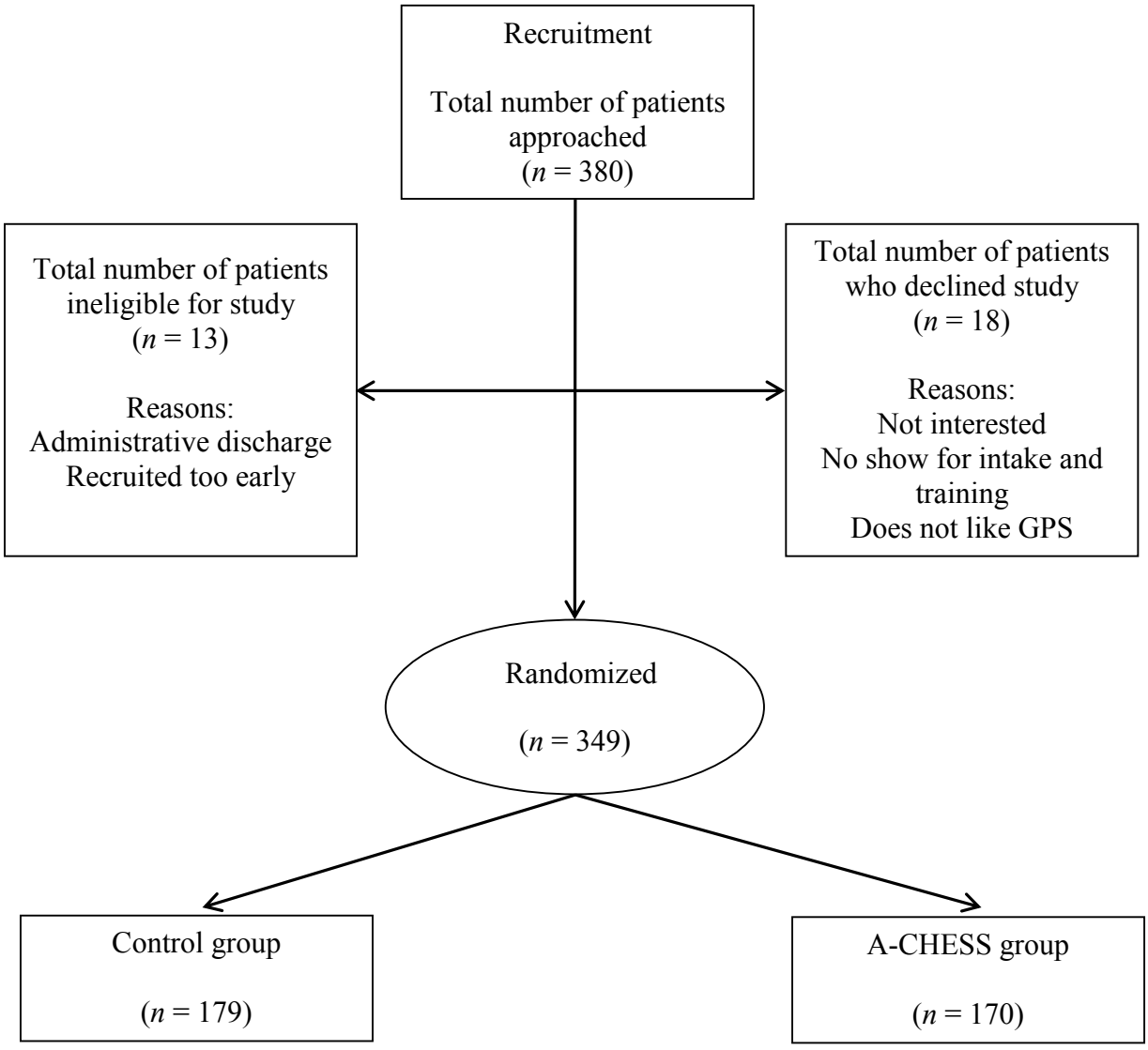

Figure 1. **CONSORT diagram of participant flow in A-CHESS study**

A-CHESS Discussion Groups and Study Sample

The smartphone-based support groups examined in this dissertation were online bulletin board-formatted discussion groups within A-CHESS. The A-CHESS discussion groups allowed group members to anonymously share emotional support and information with others (peer patients and counselors) assigned to their A-CHESS study. As shown in Figure 2, they were text-based, asynchronous bulletin boards, accessible 24 hours a day, 7 days a week through a smartphone application. In addition, the discussion groups were one of the most frequently used services within A-CHESS (McTavish et al., 2012). All users logged into the groups with code names and passwords to protect their privacy. The rules and guidelines for appropriate use of discussion group were provided in training. Study moderators who had been trained monitored discussions so as to ensure that messages were supportive and contained only appropriate information. These moderators often had a social work background and years of experience in monitoring online support groups.

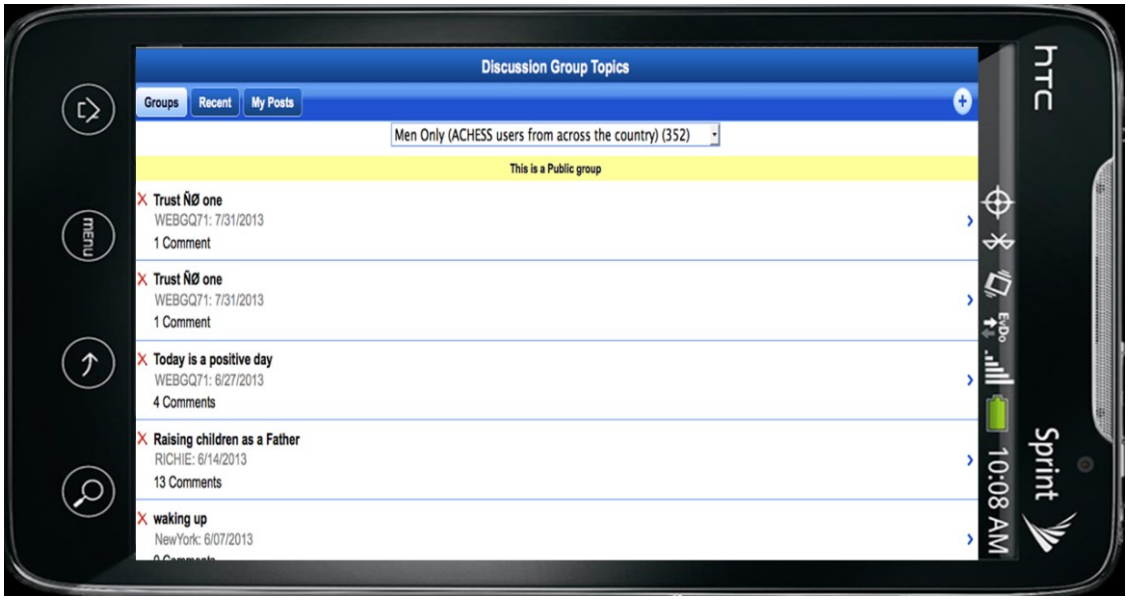

Figure 2. **A-CHESS discussion groups**

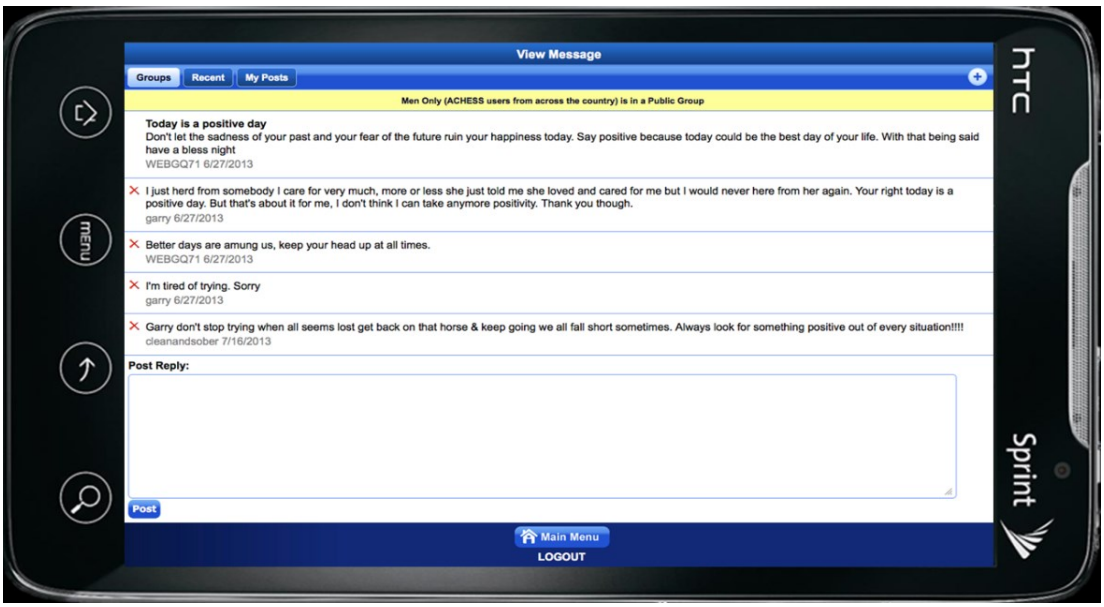

Figure 2. **A-CHESS discussion groups (continued)**

Of the 170 participants who could access A-CHESS discussion groups through their smartphones, 153 actually participated in the group activity. Because there is a reasonable lower limit to require when investigating the association between participation in online support groups and benefits (Han et al., 2011), 27 non-participants were excluded from this study. Therefore, the final sample for this dissertation was limited to the 153 patients who either wrote or read at least one message in A-CHESS discussion groups during the 12-month study period.

The mean age of these sample patients was 38.40 years (*SD* = 9.63), with a range of 20 to 44 years. Of these, 57.5% were male and 42.5% were female. The racial characteristics of the participants were 83.0% Caucasian, 13.1% African American, and 3.9% other. Education background was diverse, with 34.6% having a high school diploma or general educational development, 26.8% having some college courses, 19.6% having some high school, 8.5% having 4-year college degree or higher, 5.9% having 2-year college degree, and 4.6% never attended

high school. Most of patients (80.4%) were unemployed and lived with others after treatment (87.6%). With respect to addiction-related and treatment information, 61.4% of patients used or abused other drugs other than alcohol. In addition, the average number of previous treatment for addiction was 4.04 (*SD* = 7.05), with a range of 0 to 51 and the average length of having drinking problems was 16.59 years (*SD* = 10.01), with a range of 0 to 40 years. On average, participants had attempted to quit drinking 10.32 times (*SD* = 32.41), with a range of 0 to 365 times and the average length of longest abstinence was 563.87 days (*SD* = 852.03) with a range of 0 to 5840 days. In regard of psychosocial characteristics, 60.1% of patients responded that they were high-risk takers. Almost all patients (96.1%) perceived that they had at least one person to whom they could turn for support (see Table 2).

Table 2

Demographic, Clinical, and Psychosocial Characteristics of the Study Sample

Characteristics	Participants (*n* = 153)
Age	
Mean (*SD*)	38.40 (9.63)
Gender	
Male	88 (57.5%)
Female	65 (42.5%)
Ethnicity	
Caucasian	127 (83.0%)
African American	20 (13.1%)
Other	6 (3.9%)
Education	
Never attended high school	7 (4.6%)
Some high school	30 (19.6%)
High school diploma or GED	53 (34.6%)
Some college courses	41 (26.8%)
2-year college degree	9 (5.9%)
4-year college degree	12 (7.8%)
Graduate degree	1 (0.7%)
Living alone	
Yes	19 (12.4%)
No	134 (87.6%)
Current employment	
Yes	30 (19.6%)
No	123 (80.4%)
Number of treatment	
Mean (*SD*)	4.04 (7.05)
Using other drugs besides alcohol	
Yes	94 (61.4%)
No	59 (38.6%)
Duration of drinking problems (years)	
Mean (*SD*)	16.59 (10.01)
Number of attempt to quit drinking	
Mean (*SD*)	10.32 (31.41)
Longest period of sobriety (days)	
Mean (*SD*)	563.87 (852.03)
High-risk taker	
Yes	92 (60.1%)
No	61 (39.9%)
Perceived availability of support	
Yes	147 (96.1%)
No	6 (3.9%)

Data Construction

The data used in the current study resulted from a combination of three major data components: (1) messages posted in A-CHESS discussion groups, (2) action log data of A-CHESS discussion group usage, and (3) multiple waves of survey data collected from participants before and after the intervention. To generate the completely merged data, each dataset was collected and analyzed via the following analyses. This data construction process has been commonly used to capture actual supportive communication in online interactions and to gauge the effects on outcomes (Han et al., 2011; E. Kim et al., 2012; E. Kim et al., 2011; Namkoong et al., 2014; Namkoong et al., 2010; Yoo et al., 2013; Yoo et al., 2014).

Computer-aided content analysis. To explore emotional support, this research first analyzed the entire body of each subject's discussion messages within A-CHESS discussion groups. Examination of emotional support was accomplished through a content analysis, which has been found to be effective at unobtrusively identifying the type and pattern of social support content in messages posted by patients in online support groups (Neuendorf, 2002). To process efficiently the large amount of online information, a computer-aided content analysis was conducted; it provided not only efficient tools to handle a large amount of content but also reliable results with limited errors. Previous research has applied widely available word counting programs, particularly the Linguistic Inquiry Word Count (LIWC) program for examining physical and mental health benefits of using words related to various linguistic dimensions in online support groups (Han et al., 2008; Lieberman & Goldstein, 2006; B. R. Shaw et al., 2007; B. R. Shaw, Hawkins, McTavish, Pingree, & Gustafson, 2006). However, LIWC was inattentive to changes of meaning based on linguistic context. Such coding programs are limited to dealing

with the syntactical complexities of language, such as homographs (e.g., "shift," a period at work, vs. "shift," to move quickly), heterophones (e.g., "bass," a stringed instrument, vs. "bass," a freshwater fish), qualification (e.g., a physical "wound" vs. an emotional "wound"), and negation (e.g., "helping" vs. not "helping") (Han et al., 2011).

This dissertation used, as a compelling alternative of the word counting coding programs, Provalis Research's QDA Miner 4.1 and WordStat 6.1. These two programs make up a suite of tools that allows for integrating a variety of content analysis and text mining algorithms to systematically analyze the semantic and/or lexical content of text data (T. Johnson, 2007; Pollach, 2010). QDA Miner is a text management and qualitative analysis program which allows one to create and edit data files, import documents, and perform manual coding of those documents. Several analysis tools are also available for looking at the frequency of manually assigned codes and the relationship between those codes and other categorical or numeric variables. WordStat is a quantitative content and text-mining software application that performs simple descriptive analyses of word occurrences or can investigate relationships between words or categories of words and other numeric or categorical variables with lemmatization, stemming, stop lists, hierarchical categorization of words, word patterns and phrases. When used in conjunction with coding from QDA Miner, WordStat can provide assistance for a more systematic application of coding rules and assist in revising existing coding using Keyword-In-Context (KWIC) tables. The software was used to analyze the 2,746 messages posted by A-CHESS discussion group participants during the study period. Consistent with writing norms of online support groups, the unit of analysis was a discrete message.

In a computer-aided content analysis, there were several steps to detecting emotional support in A-CHESS discussion messages. First, an extensive review of the relevant literature

was performed to establish the coding categories of emotional support and their definitions. Cutrona and Suhr (1994) identified as the main constructs of emotional support empathy, relationship, prayers, encouragement, physical affection, sympathy, and confidentiality. Other scholars have defined as the primary categories physical affection, confidentiality, sympathy, understanding, encouragement, prayer, and universality (Braithwaite et al., 1999; Coursaris & Liu, 2009; B. R. Shaw et al., 2000).

By adopting and modifying the typology of emotional support proposed by the traditional literature of social support, Bambina (2007) developed a coding scheme to depict and classify the various kinds of emotional support exchanged in online support groups. The coding scheme included sympathy, understanding/empathy, encouragement, caring/concern, and affirmation/validation in emotional support categories. Recent research has examined the effects of expressing and/or receiving emotional support on psychosocial outcomes in online support groups (Han et al., 2011; E. Kim et al., 2012; E. Kim et al., 2011; Namkoong et al., 2014; Yoo et al., 2013; Yoo et al., 2014). The coding schemes used in their studies indicated that emotional support was composed of several components such as understanding, empathy, concern, sympathy, reassurance, encouragement, physical affection, relationship, universality, confidentiality, prayer, Christian beliefs, and general religious conviction. Taken together, this study created the following six coding categories of emotional support to develop coding rules that accurately reflect a range of emotional support constructs: (1) empathy/sympathy, (2) encouragement/reassurance, (3) care/physical affection, (4) universality/interrelationship, (5) Christian beliefs/prayer, and (6) general religious/spiritual views (see Table 3).

Table 3

Coding Categories of Emotional Support

Emotional support	Definition
Empathy/sympathy	Understanding and identifying with another person's feelings, and responding compassionately to another person's distress
Encouragement/reassurance	Providing each other with hope and confidence
Care/physical affection	Expressing physical contact verbally (e.g., hugs) and caring and love
Universality/relationship	Realization that one's problems are shared by others
Christian beliefs/prayer	Sending prayers to another person, as well as statements assuring others that God is there to provide them support
General religious/spiritual views	General proclamations of one's religiosity, religious faith, or belief in the greatness of God

Another process for designing the coding scheme in this dissertation was to create the coding categories according to whether emotional support was requested. The coding categories of emotional support proposed above were specifically dedicated to investigating the types of emotional support exchanged (provided and received) in online support groups. In the context of seeking support, the types might be less important because seeking emotional support generally might take place to fulfil a need for general support rather than a specific type of emotional support. Additionally, support seekers might often receive a type of support that they did not wish to obtain. For these reasons, previous research has focused on characterizing how individuals seek support, largely ignoring the topics of seeking support (Pierce, Sarason, Sarason, Joseph, & Henderson, 1996). Due to the usually vague nature of these types of messages, Coursaris and Liu (2009) classified all messages related to seeking emotional support in online support groups into one category of seeking emotional support. Therefore, this study created

coding categories to identify how patients seek emotional support rather than what kinds of emotional support patients seek in A-CHESS discussion groups.

Pierce et al. (1996) suggested that seeking emotional support can be either direct or indirect. Direct attempts to elicit support from others involve making explicit requests for assistance. Indirect attempts focus on communicating one's need for support without actually asking for assistance. The support online (SOL) coding scheme developed by Bambina (2007) classifies how to seek support into three commonly occurring styles: (1) clear-cut requests, (2) negative sentiments, and (3) accounts. Clear-cut requests are easily identifiable because they take the form of direct questions where individuals ask for things like prayers or support. Negative sentiments such as distress, fear, and sorrow convey the need to be assuaged and are more tacit forms of requests. Accounts describing past experiences, prognosis, and updates are also tacit invitations. Based on Bambina's coding scheme, this study developed three coding categories of seeking emotional support (see Table 4).

Table 4

Coding Categories of Seeking Emotional Support

Seeking emotional support	Definition
Clear-cut requests	Direct questions where members ask for things like prayers or support
Negative sentiments	Expressing distress, fear, and sorrow to convey the need to be assuaged
Accounts	Describing past experiences, prognosis, and updates

After defining these coding categories, the study created dictionaries of keywords associated with each category. Once data was imported, WordStat 6.1 allowed the performing of a univariate keyword frequency analysis to investigate high frequency words. In addition, the

software provided an integrated clustering and dendrogram display of keyword co-occurrence to easily identify all keywords that co-occurred with one or several target keywords. The keywords of each coding category were derived from a quantitative keyword analysis and a review of extant literature. For example, "sorry" served as a starting point for the empathy/sympathy category and "hope" served as a good indicator for the encouragement/reassurance category (see Table 5).

Table 5

Coding Categories and Keywords

Emotional support	**Keywords**
Empathy/sympathy	Empathy, sympathy, understand, sorry, worry, concern, etc.
Encouragement/reassurance	Hope, wish, trust, congratulation, proud, cheer, hang in there, good jobs, way to go, here for you, etc.
Care/physical affection	Take care, hugs, kisses, touch, love, miss, welcome, thank, etc.
Universality/relationship	Common, isolated, team, not alone, together, look forward, etc.
Christian beliefs/prayer	God support, God with you, pray for you, my prayers, bless, etc.
General religious/spiritual views	God, Lord, Holy Spirit, Jesus, angel, bible, church, gospel, heaven, faith, trust, etc.
Seeking emotional support	**Keywords**
Clear-cut requests	Help, support, need, look for, question, pray for me, etc.
Negative sentiments	Angry, crazy, pain, hurt, hard, rough, tough, upset, fear, scary, cry, depress, sad, suffer, powerless, etc.
Accounts	Clean, relapse, free, sober, day, month, today, weekday, weekend, year, etc.

Using the keyword dictionaries, coding rules were created by establishing a relationship between multiple terms, phrases, or concepts. The WordStat rules editor was used to define complex coding rules to specify under what conditions a particular idea or category of ideas should be coded. An idea category consisted of a single term or several words. For instance, the positive emotion category included a wide range of relevant terms, such as "awesome," "best," "better," "cool," "fun," "glad," "good," "grateful," "great," "happy," "nice," "proud," "relieve," "well," "wonderful," etc. The category of second-person pronouns contained not only a smaller set of word derivatives, such as "you," "your," and "yourself" but also phrases, such as "you all," "any of you," and so forth. After the idea categories had been defined, coding schemes were developed to only code the combination of those idea categories. A reference to an idea category with more than one word was preceded by the pound sign (#). A rule could consist of up to three categories, each category linking each other using a Boolean (AND, OR, and NOT) or a proximity operator (NEAR, BEFORE and AFTER, or their negative forms, NOT NEAR, NOT BEFORE, NOT AFTER). When a proximity operation was used, the maximum distance in number of words was specified to separate the two categories. This function enabled the capturing of emotional support as it occurred in natural language without capturing different concepts that used the same terms. For example, "I am so proud of you and all of your accomplishments" was coded by making the coding rule shown in Figure 3. The first idea category, PROUD, refers to a single word while #YOU matches any item found in the YOU idea category. Accordingly, this rule was code for encouragement/reassurance only if the word PROUD appeared within 5 words ahead of the YOU idea category. (see Appendix A and B for details on coding schemes).

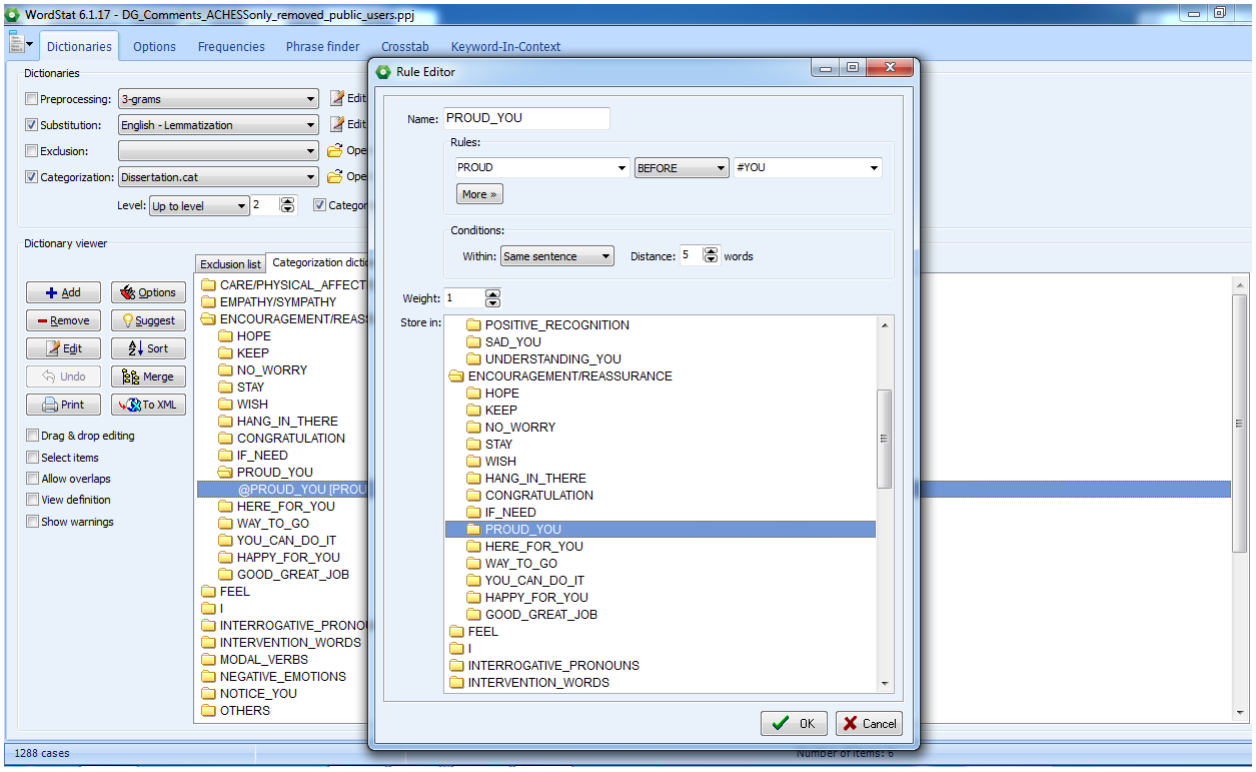

Figure 3. **A coding rule of encouragement/reassurance**

Lastly, reliability estimates were conducted on a random subset of 200 discussion post from A-CHESS discussion groups. In order to compare results between human coding and computer coding, two human coders coded the same set of discussion posts by using the same coding schemes. Reliability between human coding and computer coding was assessed with Krippendorff's alpha, which was on average .87, an acceptable degree of reliability (Hayes & Krippendorff, 2007). The reliability in the coding categories ranged from a high of .95 for care/physical affection to a low of .72 for empathy/sympathy. Additional reliability scores were .94 for general religious/spiritual views, .93 for clear-cut requests, .90 for negative sentiments, .88 for universality/interrelationship, .85 for accounts, and .82 for encouragement/reassurance, and .82 for Christian beliefs/prayer.

Action log data analysis. Although computer-aided content analysis can capture what kinds of emotional support were provided and how emotional support was requested online, the content analysis itself reveals little about the effects of message expression and reception unless it is combined with data that can measure who wrote and read each coded message. This dissertation thus integrated the results of content analysis of emotional support in A-CHESS discussion group messages with action log data gathered in the A-CHESS database management system. Each A-CHESS study participant had a unique log-in allowing the A-CHESS research team to automatically collect A-CHESS usage data in server log files for later analysis (McTavish et al., 2012). The action log data collection system enabled me to track a variety of individual participants' usage statistics, including date and time a participant entered A-CHESS, the service selected, how long each service was used, the pages viewed, and whether the participant sent or received messages. With regard to A-CHESS discussion group usage, these data provided information on which participant wrote and/or read each message. As shown in Table 6, log data on A-CHESS discussion group usage included a participant's codename, date, time, and the URL of every discussion page requested on the sever.

Table 6

Examples of A-CHESS Discussion Group Use Log Data

Activity	Data ID	Codename	User ID	Date/time	URL
Writing	372	genem	14	16-Feb-2010 13:54:11	/achess/dr/writemsg.aspx?guid=14
	374	terryh	11	16-Feb-2010 13:54:16	/achess/dr/writemsg.aspx?guid=11
	379	matthewg	12	16-Feb-2010 13:54:32	/achess/dr/writemsg.aspx?guid=12
Reading	381	genem	14	16-Feb-2010 13:55:07	/achess/dr/listmsgs.aspx?guid=14&msgid=1
	385	matthewg	12	16-Feb-2010 13:55:45	/achess/dr/listmsgs.aspx?guid=12&msgid=2
	388	rodneys	13	16-Feb-2010 13:55:58	/achess/dr/listmsgs.aspx?guid=13&msgid=3

Taking an example from the first case, a participant with the codename “genem” wrote a message in a discussion group within A-CHESS. This activity took place on February 16, 2010 at 13:54:11 and assigned to this writing activity was the data number 372. After posting the message, the same participant read a discussion message having the ID number 1 on the same day at 13:55:07. This reading of this message was given the data number 381. Indeed, such data contained records not just of the content of messages that participants read, but also of the content of the messages they wrote. Aggregated for each participant, the resulting data included the cumulative number of messages written and read by an individual patient, as well as content-coding scores across coding categories of emotional support. Therefore, measures could be taken of how much emotional support was provided, requested, and received in terms of each participant within A-CHESS discussion groups.

Multiple waves of survey data. The action-level, content-coded data were finally combined with the multi-wave survey data to examine the research inquires. When patients agreed to be in the A-CHESS study, they completed a pretest survey on demographic backgrounds, psychosocial characteristics, and clinical information related to alcoholism. The A-CHESS research team called the patients to request the outcome survey at 4, 8, and 12 months after the intervention began. The post-survey asked about risky drinking days, quality of life, treatment services received, and coping strategies. Most patients completed this survey in approximately 15-25 minutes. If researcher's calls and messages went unanswered, researchers called the backup contact. To complete all three telephone surveys, 20 calls were required per patient on average. Of 170 patients in the A-CHESS intervention group, 152 (89.4%) completed the survey at 4 months, 146 (85.9%) completed it at 8 months, and 132 (77.7%) completed the survey at 12 months. Therefore, this study had the outcome survey responses at three time points.

Measures

Communicating emotional support. This dissertation categorized the communication of emotional support into four supportive behaviors: (1) seeking emotional support, (2) giving emotional support, (3) receiving emotional support from peer patients, and (4) receiving emotional support from health care providers. To construct these variables, I used a measure of proportion, indicating that each variable was measured by the total count of each coding category divided by total number of messages written or read. This measurement makes more sense than simply using raw scores because there is significant variance among participants in the total volume of messages written or read. This can also rule out the potential confounding effects of writing and reading other types of supportive content in the messages. Previous studies have

commonly used these ratio variables (E. Kim et al., 2012; E. Kim et al., 2011; Namkoong et al., 2014; Yoo et al., 2013; Yoo et al., 2014).

According to this approach, seeking emotional support was measured by the total count of seeking emotional support divided by total number of messages written (M = .13, SD = .25 at 4 months; M = .14, SD = .24 at 8 months; and M = .14, SD = .24 at 12 months). Giving emotional support was measured by the total count of giving emotional support divided by total number of messages written (M = .62, SD = .73 at 4 months; M = .64, SD = .72 at 8 months; and M = .64, SD = .73 at 12 months). Receiving emotional support from peer patients was measured by the total count of receiving emotional support provided by peer patients divided by total number of messages read (M = .76, SD = .46 at 4 months; M = .79, SD = .46 at 8 months; and M = .79, SD = .45 at 12 months). Receiving emotional support from health care providers was measured by the total count of receiving emotional support provided by health care providers divided by total number of messages read (M = .12, SD = .20 at 4 months; M = .12, SD = .20 at 8 months; and M = .12, SD = .20 at 12 months). Table 7 presents descriptive statistics of supportive communication behaviors in A-CHESS discussion groups.

Table 7

Descriptive Statistics of Supportive Communication Behaviors in A-CHESS Discussion Groups (n = 153)

Pretest – 4 months	***M***	***SD***	***Min***	***Max***
Total number of messages written	11.50	15.77	0	72.00
Total number of messages read	159.95	219.69	0	1206.00
Seeking emotional support	.13	.25	0	2.00
Giving emotional support	.62	.73	0	5.00
Receiving emotional support from patients	.76	.46	0	2.06
Receiving emotional support from providers	.12	.20	0	1.14
Pretest – 8 months	***M***	***SD***	***Min***	***Max***
Total number of messages written	14.73	20.92	0	104.00
Total number of messages read	213.61	311.92	0	1672.00
Seeking emotional support	.14	.24	0	2.00
Giving emotional support	.64	.72	0	5.00
Receiving emotional support from patients	.79	.46	0	2.24
Receiving emotional support from providers	.12	.20	0	1.14
Pretest – 12 months	***M***	***SD***	***Min***	***Max***
Total number of messages written	16.17	24.60	0	154.00
Total number of messages read	236.31	380.23	0	2324.00
Seeking emotional support	.14	.24	0	2.00
Giving emotional support	.64	.73	0	5.00
Receiving emotional support from patients	.79	.45	0	2.24
Receiving emotional support from providers	.12	.20	0	1.14

Note. The statistics of seeking, giving and receiving emotion support indicate proportion scores.

Emotional distress. Emotional distress was measured by modifying the negative affect (NA) subscale of an International Positive and Negative Affect Schedule (PANAS) Short Form (I-PANAS-SF) (E. R. Thompson, 2007). The NA scale of the I-PANAS-SF reflects a general dimension of unpleasant engagement and subjective distress that subsumes a broad range of aversive affects, including fear, nervousness, guilt, and shame. A-CHESS researchers developed a self-report measure of NA by removing and retaining the NA scale of the original I-PANAS-SF. The A-CHESS NA scale consisted of 13 items that describe negative feelings and emotions: (1) helpless, (2) tense, (3) angry, (4) hopeless, (5) worried, (6) frustrated, (7) sad, (8) anxious, (9) upset, (10) hostile, (11) ashamed, (12) nervous, and (13) afraid. Patients were asked to rate the

extent to which they had experienced each particular feeling and emotion during the last month. Responses to each item were recorded on a 5-point scale ranging from 1 (almost never) to 5 (almost always) and all scores were averaged to create an index for emotional distress (M = 2.50, SD = .87, Chronbach's α = .92 at 4 months; M = 2.32, SD = .78, Chronbach's α = .91 at 8 months; and M = 2.35, SD = .90, Chronbach's α = .94 at 12 months).

Coping strategies. Coping strategies were measured with an 8-item, self-report questionnaire of Coping Behaviours Inventory (CBI) (Litman, Stapleton, Oppenheim, & Peleg, 1983). The CBI was originally designed to assess the behaviors used by alcoholics to prevent, avoid, or control excessive drinking. Patients were asked to indicate on a 5-point scale ranging from 1 (almost never) to 5 (almost always) how often they used the following coping methods to stop themselves from drinking: (1) hanging out with family or friends, talking with a therapist or someone else in recovery, going to 12-step meetings, (2) avoiding places where they drank/used, leaving their money, etc., (3) looking at issues in their life that contributed to their addiction and talking steps to change them, (4) viewing their addiction as something to learn from, (5) turning to work or other activities, such as exercise, shopping, sleeping, seeing a movie, etc., (6) remembering how much their drinking has hurt themselves, their family and friends, (7) paying attention to when they are hungry, angry, lonely or tired and taking care of those things, and (8) thinking about the ways alcohol or drug use is not good for them, or thinking positively about how their life will be better without it. Responses to all items were averaged to form an index of coping strategies (M = 4.29, SD = .71, Chronbach's α = .83 at 4 months; M = 4.30, SD = .72, Chronbach's α = .85 at 8 months; and M = 4.33, SD = .77, Chronbach's α = .89 at 12 months).

Risky dinking days. The primary outcome of this study was risky drinking days. The study defined such days as those on which a patient's drinking in a 2-hour period exceeded 4 standard drinks for men and 3 standard drinks for women, using the National Institute on Alcohol Abuse and Alcoholism definition of a standard drink as one containing roughly 14 grams of pure alcohol (12 oz. of regular beer, 5 oz. of wine, or 1.5 oz. of distilled spirits) (Gustafson et al., 2014). Patients reported the number of risky drinking days they had in the previous 30 days (M = 1.50, SD = 4.92 at 4 months; M = 1.50, SD = 4.98 at 8 months; and M = 1.00, SD = 4.02 at 12 months).

Analytic Framework

The analyses of this study proceeded in three stages. First, ordinary least square (OLS) hierarchical regression analyses were conducted to test the antecedents of communicating emotional support such as (1) seeking emotional support, (2) giving emotional support, (3) receiving emotional support from peer patients, and (4) receiving emotional support from health care providers at three time periods (4, 8, and 12 months). In each analysis, each type of communication of emotional support was regressed on three sets of predictors. Demographic backgrounds were entered into the first block. The second and third blocks included a variety of clinical information and psychosocial factors, respectively.

In the second stage, three OLS hierarchical regression analyses were performed to examine the direct and stress-buffering roles of communicating emotional support in preventing risky drinking days at three time points. In each regression model, demographic and clinical controls were entered in the first block. To examine the direct relationships between communicating emotional support and risky drinking days, the second block consisted of seeking

emotional support, giving emotional support, receiving emotional support from peer patients, and receiving emotional support from health care providers. For an analysis of stress-buffering roles, emotional distress was entered into the third block and then the hypothesized two-way interaction terms were entered into the final block. Interaction terms were constructed by multiplying the standardized values of the main effect variables to reduce possible multicollinearity problems between the interaction terms and their components (J. Cohen, Cohen, West, & Aiken, 2003).

To examine the mediating roles of coping strategies in the relationship between communicating emotional support and risky drinking days, this study finally used structural equation modeling (SEM) with observed variables in Mplus 6.1 (Muthén & Muthén, 2010) at three time periods. Since SEM allows for the simultaneous estimation of all parameters in a model, all coefficients in a model indicate the relation between two variables after controlling for all exogenous variables in the model (Namkoong et al., 2012). Accordingly, this method enabled me to examine the direct influence of communicating emotional support on risky drinking days and to test the indirect effect through coping strategies, the main intermediary variable of this study. Each mediation model included demographic backgrounds, treatment and addiction-related information, as exogenous variables. Antecedent endogenous variables included measures of seeking emotional support, giving emotional support, receiving emotional support from peer patients, and receiving emotional support from health care providers. Consequence endogenous variable was risky drinking days. Coping strategies were included as endogenous variables that link the relationships between the antecedent endogenous variables and the final endogenous variable.

Chapter 6: Results

Model I: Predictors of Communicating Emotional Support

Table 8, 9, and 10 present the results of hierarchical regression analyses examining the effects of several potential predictors on communicating emotional support within A-CHESS discussion groups at 4, 8, and 12 months following the commencement of the intervention.

Table 8

Hierarchical Regression Analyses Predicting Communicating Emotional Support at 4 Months (n = 153)

	Pretest - 4 months			
	Seeking	**Giving**	**Receiving from patients**	**Receiving from providers**
Block 1: Demographic backgrounds (pretest)				
Age	-.11	-.07	-.02	.12
Gender (female = 1)	.08	**.23****	**.39*****	**-.17***
Employment (employed = 1)	.15#	.02	.11	-.09
Ethnicity (Caucasian = 1)	-.01	.11	-.07	.01
Education	-.13	-.15#	-.09	.06
Living alone (yes = 1)	-.07	**.20***	.15#	-.12
ΔR^2 (%)	5.8	**11.5****	**16.9*****	5.7
Block 2: Treatment and addiction-related information (pretest)				
Number of treatment	-.08	-.11	-.11	-.16#
Using other drugs besides alcohol (yes = 1)	.04	.05	.04	**.19***
Duration of drinking problems (years)	.02	-.11	.002	.15
Number of attempt to quit drinking	-.04	-.03	.10	**.26****
Longest period of sobriety (days)	.001	.11	-.05	**.26****
ΔR^2 (%)	0.8	2.2	2.6	**17.6*****
Block 3: Psychosocial factors (pretest)				
High risk taker (yes = 1)	.11	.05	.00	-.01
Perceived availability of support (yes = 1)	.03	.04	.02	.03
ΔR^2 (%)	1.0	0.3	0.0	0.1
Total R^2 (%)	7.6	14.0	19.5	23.4

Note. Cell entries refer to the standardized regression coefficient.
#$p < .10$, *$p < .05$, **$p < .01$, and ***$p < .001$.

Table 9

Hierarchical Regression Analyses Predicting Communicating Emotional Support at 8 Months (n = 153)

	Pretest - 8 months			
	Seeking	**Giving**	**Receiving from patients**	**Receiving from providers**
Block 1: Demographic backgrounds (pretest)				
Age	-.13	-.08	.01	.14#
Gender (female = 1)	.09	**.21****	**.36*****	**-.16***
Employment (employed = 1)	.14#	.02	.07	-.09
Ethnicity (Caucasian = 1)	-.03	.07	-.05	.01
Education	-.12	-.15#	-.07	.09
Living alone (yes = 1)	-.09	**.22****	.10	-.12
ΔR^2 (%)	6.1	**11.0****	**13.4****	6.4
Block 2: Treatment and addiction-related information (pretest)				
Number of treatment	-.09	-.11	-.12	-.09
Using other drugs besides alcohol (yes = 1)	.01	.06	.08	**.20***
Duration of drinking problems (years)	.03	-.12	-.14	.15
Number of attempt to quit drinking	-.05	-.03	.09	**.27*****
Longest period of sobriety (days)	.02	.12	-.02	**.25****
ΔR^2 (%)	0.9	2.4	3.8	**17.0*****
Block 3: Psychosocial factors (pretest)				
High risk taker (yes = 1)	.09	.05	-.01	.02
Perceived availability of support (yes = 1)	.03	.02	.06	.002
ΔR^2 (%)	0.7	0.2	0.3	0.0
Total R^2 (%)	7.7	13.6	17.5	23.4

Note. Cell entries refer to the standardized regression coefficient.
#$p < .10$, *$p < .05$, **$p < .01$, and ***$p < .001$.

Table 10

Hierarchical Regression Analyses Predicting Communicating Emotional Support at 12 Months (n = 153)

	Pretest - 12 months			
	Seeking	**Giving**	**Receiving from patients**	**Receiving from providers**
Block 1: Demographic backgrounds (pretest)				
Age	-.12	-.08	.01	.15#
Gender (female = 1)	.11	**.22****	**.36*****	**-.17***
Employment (employed = 1)	.12	.03	.07	-.10
Ethnicity (Caucasian = 1)	-.03	.08	-.05	.01
Education	-.13	-.15#	-.06	.09
Living alone (yes = 1)	-.09	**.21****	.10	-.12
ΔR^2 (%)	6.1	**11.1****	**13.3****	6.7
Block 2: Treatment and addiction-related information (pretest)				
Number of treatment	-.09	-.11	-.12	-.08
Using other drugs besides alcohol (yes = 1)	-.004	.07	.08	**.20***
Duration of drinking problems (years)	.02	-.12	-.15	.15
Number of attempt to quit drinking	-.04	-.03	.08	**.27*****
Longest period of sobriety (days)	.02	.13	-.02	**.25****
ΔR^2 (%)	0.9	2.6	3.8	**17.0*****
Block 3: Psychosocial factors (pretest)				
High risk taker (yes = 1)	.10	.04	-.01	.02
Perceived availability of support (yes = 1)	.03	.03	.06	.00
ΔR^2 (%)	0.9	0.2	0.3	0.0
Total R^2 (%)	7.9	13.9	17.4	23.7

Note. Cell entries refer to the standardized regression coefficient.
#$p < .10$, *$p < .05$, **$p < .01$, and ***$p < .001$.

As shown in the first block of each table, gender was a significant predictor of giving emotional support (β = .23, $p < .01$ at 4 months; β = .21, $p < .01$ at 8 months; and β = .22, $p < .01$ at 12 months), receiving emotional support from peer patients (β = .39, $p < .001$ at 4 months; β = .36, $p < .001$ at 8 months; and β = .36, $p < .001$ at 12 months), and receiving emotional support from health care providers (β = -.17, $p < .05$ at 4 months; β = -.16, $p < .05$ at 8 months; and β = -

.17, $p < .05$ at 12 months). Female patients were more likely than male patients to not only provide emotional support but also receive emotional support from peer patients. However, male patients were more likely than female patients to receive emotional support from health care providers. In addition, living alone was found to be a positive predictor of giving emotional support ($\beta = .20$, $p < .05$ at 4 months; $\beta = .22$, $p < .01$ at 8 months; and $\beta = .21$, $p < .01$ at 12 months). Patients living alone were more likely to give emotional support than were those living with others. Other demographic factors, including age, employment, and ethnicity, had no influence on communicating emotional support. Demographic variables accounted for a large number of variance in giving emotional support and receiving emotional support from peer patients at all time periods (for giving emotional support and receiving emotional support from peer patients, respectively, incremental R^2 = 11.5%, 16.9% at 4 months; incremental R^2 = 11.0%, 13.4% at 8 months; and incremental R^2 = 11.1%, 13.3% at 12 months).

Treatment and addiction-related backgrounds were the strongest predictors of receiving emotional support from health care providers at three time periods. As shown in the second block of each table, receiving emotional support from health care providers was positively predicted by using other drugs besides alcohol ($\beta = .19$, $p < .05$ at 4 months; $\beta = .20$, $p < .05$ at 8 months; and $\beta = .20$, $p < .05$ at 12 months), the number of attempt to quit drinking ($\beta = .26$, $p < .01$ at 4 months; $\beta = .27$, $p < .001$ at 8 months; and $\beta = .27$, $p < .001$ at 12 months), and longest period of sobriety ($\beta = .26$, $p < .01$ at 4 months; $\beta = .25$, $p < .01$ at 8 months; and $\beta = .25$, $p < .01$ at 12 months). Patients who used other drugs besides alcohol were more likely to receive emotional support from health care providers than were those who did not. Patients who attempted more often to quit drinking were more likely to receive emotional support from health care providers. Patients who maintained longer periods of sobriety were more likely to receive emotional

support from health care providers. Other two factors, number of addiction treatment and duration of drinking problems, had no significant impact on communicating emotional support. Treatment and addiction-related information accounted for the greatest amount of variance in receiving emotional support from health care providers (incremental R^2 = 17.6% at 4 months; incremental R^2 = 17.0% at 8 months; and incremental R^2 = 17.0% at 12 months).

As for psychosocial factors, this study did not find any significant predictors of seeking, giving, and receiving emotional support at 4, 8, and 12 months.

Model II: Direct and Stress-Buffering Roles of Communicating Emotional Support

Table 11 shows the results of a hierarchical regression analysis to test direct and stress-buffering functions of communicating emotional support in reducing risky drinking days at 4 months. These findings present whether (1) communicating emotional support was negatively related to risky drinking days and (2) communicating emotional support moderated the positive relationship between emotional distress and risky drinking days.

Table 11

Hierarchical Regression Analysis Predicting Risky Drinking Days at 4 Months (n = 133)

	4 months
	Risky drinking days
Block 1: Control variables (pretest)	
Age	.02
Gender (female = 1)	.11
Employment (employed = 1)	.11
Education	**-.23***
Living alone (yes = 1)	.02
Using other drugs besides alcohol (yes = 1)	-.03
Duration of drinking problems (years)	.15
Number of attempt to quit drinking	-.01
Longest period of sobriety (days)	-.07
ΔR^2 (%)	7.9
Block 2: Effects of communicating emotional support (pretest - 4 months)	
Seeking emotional support	**.19***
Giving emotional support	-.10
Receiving emotional support from patients	-.10
Receiving emotional support from providers	.07
ΔR^2 (%)	6.6#
Block 3: Stress effect (4 months)	
Emotional distress	**.40*****
ΔR^2 (%)	**14.0*****
Block 4: Interaction effects	
Seeking emotional support × Emotional distress	**.20***
Giving emotional support × Emotional distress	-.05
Receiving emotional support from patients × Emotional distress	-.07
Receiving emotional support from providers × Emotional distress	.05
ΔR^2 (%)	3.9
Total ΔR^2 (%)	32.4

Note. Cell entries refer to the standardized regression coefficient.
#$p < .10$, *$p < .05$, **$p < .01$, and ***$p < .001$.

In the first block of Table 11, patients' education level was negatively associated with risky drinking days ($\beta = -.23$, $p < .05$). Patients with higher levels of education were less likely to report risky drinking days. However, most of the control variables in the regression model were

not significantly related to risky drinking days. All control variables explained 7.9% of the variance in risky drinking days. In the second block, seeking emotional support was positively related to risky drinking days ($\beta = .19$, $p < .05$). Patients who sought more emotional support were more likely to engage in risky drinking. However, other types of communicating emotional support were not significantly associated with risky dinking days. Communicating emotional support explained 6.6% of the variance in risky drinking days. In the third block, emotional distress was positively related to risky drinking days, indicating that patients who had higher levels of emotional distress were more likely to drink heavily ($\beta = .40$, $p < .001$). Emotional distress explained 14.0% of the variance in risky drinking days. In the final block, there was a significant interaction between seeking emotional support and emotional distress ($\beta = .20$, $p < .05$). As shown in Figure 4, patients who sought a high level of emotional support were more likely to engage in risky drinking than were those who sought a low level of emotional support when experiencing a high level of emotional distress. In other words, seeking emotional support was positively associated with emotional distress-induced alcohol drinking. The interaction terms in the final block explained 3.9% of the variance in risky drinking days.

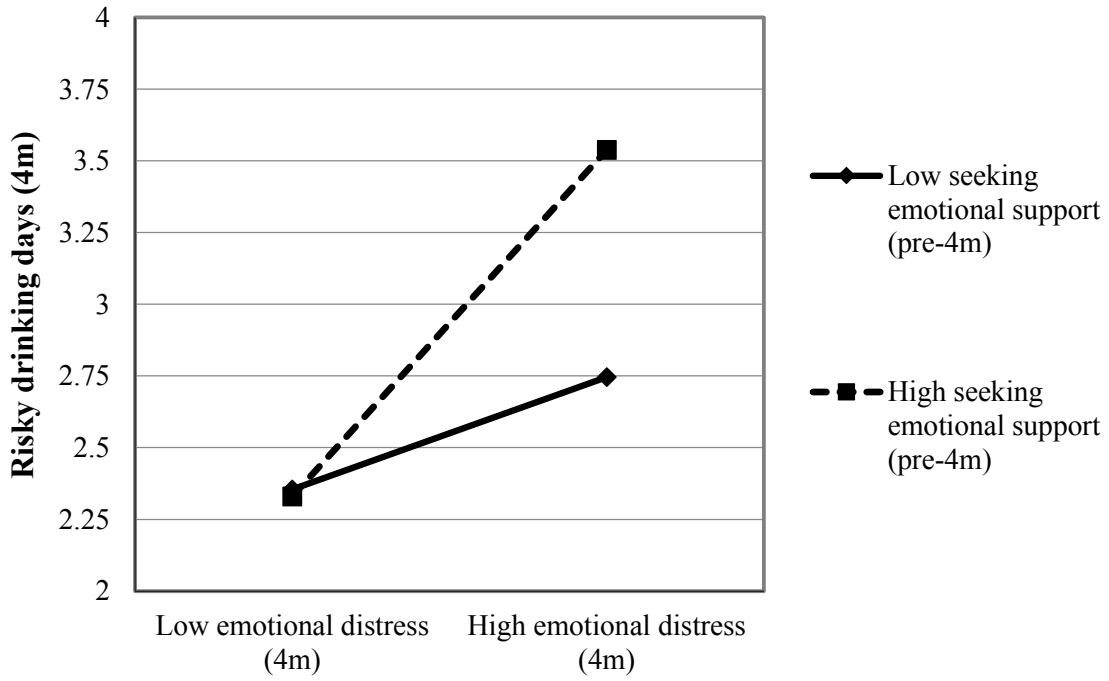

Figure 4. **Interaction between seeking emotional support and emotional distress in predicting risky drinking days at 4 months**

Note. For illustration purpose, this study plotted using the means of the four subgroups: (1) low seeking emotional support/low emotional distress; (2) low seeking emotional support/high emotional distress; (3) high seeking emotional support/low emotional distress; and (4) high seeking emotional support/high emotional distress.

Table 12 presents the findings of a hierarchical regression analysis to examine the direct and stress-buffering roles of communicating emotional support in preventing risky drinking days at 8 months.

Table 12

Hierarchical Regression Analysis Predicting Risky Drinking Days at 8 Months (n = 130)

	8 months
	Risky drinking days
Block 1: Control variables (pretest)	
Age	-.15
Gender (female = 1)	-.01
Employment (employed = 1)	-.08
Education	.09
Living alone (yes = 1)	-.09
Using other drugs besides alcohol (yes = 1)	-.15
Duration of drinking problems (years)	.06
Number of attempt to quit drinking	-.06
Longest period of sobriety (days)	-.10
ΔR^2 (%)	5.2
Block 2: Effects of communicating emotional support (pretest - 8 months)	
Seeking emotional support	-.02
Giving emotional support	.15
Receiving emotional support from patients	-.13
Receiving emotional support from providers	-.003
ΔR^2 (%)	1.5
Block 3: Stress effect (8 months)	
Emotional distress	**.32****
ΔR^2 (%)	**9.6*****
Block 4: Interaction effects	
Seeking emotional support × Emotional distress	.03
Giving emotional support × Emotional distress	.19
Receiving emotional support from patients × Emotional distress	**-.31***
Receiving emotional support from providers × Emotional distress	-.004
ΔR^2 (%)	5.1
Total ΔR^2 (%)	21.4

Note. Cell entries refer to the standardized regression coefficient.
#$p < .10$, *$p < .05$, **$p < .01$, and ***$p < .001$.

As indicated in the first block of Table 12, none of control factors was significantly associated with risky drinking days. These control measures explained 5.2% of the variance in risky drinking days. Similarly, any type of communicating emotional support was not

significantly related to risky drinking days. The second block of emotional support communication effects explained 1.5% of the variance in risky drinking days. In the third block, emotional distress was positively associated with risky drinking days ($\beta = .32$, $p < .01$). Patients who had higher levels of emotional distress were more likely to drink heavily. Emotional distress explained 9.6% of the variance in risky drinking days. The final block presents a significant interaction between receiving emotional support from peer patients and emotional distress ($\beta = -.31$, $p < .05$). As illustrated in Figure 5, emotional distress was positively related to risky drinking days for patients who received a low level of emotional support from peer patients, while it had no relationship with risky drinking days for those who received a high level of emotional support from peer patients. In other words, receiving emotional support from peer patients weakened the positive relationship between emotional distress and risky drinking days. The interaction block of this regression analysis explained 5.1% of the variance in risky drinking days.

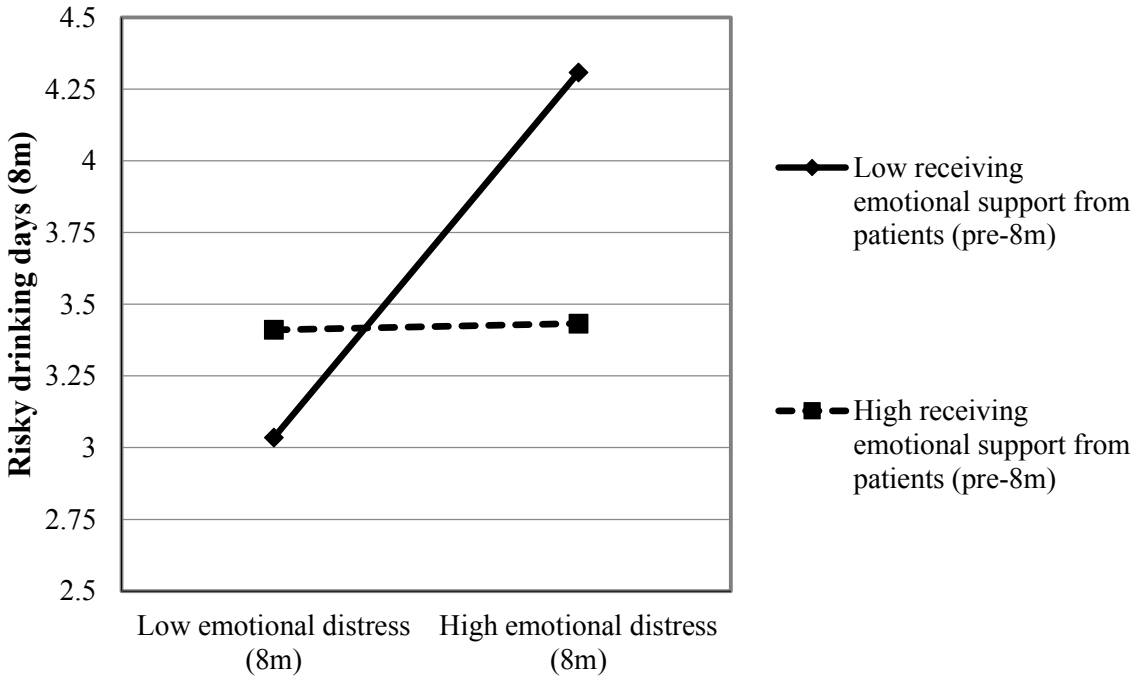

Figure 5. **Interaction between receiving emotional support from patients and emotional distress in predicting risky drinking days at 8 months**

Note. For illustration purpose, this study plotted using the means of the four subgroups: (1) low receiving emotional support from patients/low emotional distress; (2) low receiving emotional support from patients/high emotional distress; (3) high receiving emotional support from patients/low emotional distress; and (4) high receiving emotional support from patients/high emotional distress.

Table 13 displays the results of a hierarchical regression analysis to examine the direct and stress-buffering roles of communicating emotional support in preventing risky drinking days at 12 months.

Table 13

Hierarchical Regression Analysis Predicting Risky Drinking Days at 12 Months (n = 125)

	12 months
	Risky drinking days
Block 1: Control variables (pretest)	
Age	.03
Gender (female = 1)	**.21***
Employment (employed = 1)	-.01
Education	-.05
Living alone (yes = 1)	-.06
Using other drugs besides alcohol (yes = 1)	-.05
Duration of drinking problems (years)	.01
Number of attempt to quit drinking	-.09
Longest period of sobriety (days)	-.10
ΔR^2 (%)	6.3
Block 2: Effects of communicating emotional support (pretest - 12 months)	
Seeking emotional support	-.03
Giving emotional support	-.12
Receiving emotional support from patients	-.02
Receiving emotional support from providers	-.10
ΔR^2 (%)	2.2
Block 3: Stress effect (12 months)	
Emotional distress	**.29****
ΔR^2 (%)	**7.2****
Block 4: Interaction effects	
Seeking emotional support × Emotional distress	.06
Giving emotional support × Emotional distress	**-.26***
Receiving emotional support from patients × Emotional distress	.06
Receiving emotional support from providers × Emotional distress	**-.25***
ΔR^2 (%)	**6.6#**
Total ΔR^2 (%)	22.3

Note. Cell entries refer to the standardized regression coefficient.
#$p < .10$, *$p < .05$, **$p < .01$, and ***$p < .001$.

In the first block of Table 13, gender was positively related to risky drinking days (β = .21, $p < .05$). Female patients were more likely than their male counterparts to drink heavily.

The control variables of this block explained 6.3% of the variance on risky drinking days. In the second block, four types of communicating social support were not significantly associated with risky drinking days. These communication behaviors explained 2.2% of the variance in risky drinking days. In the third block, emotional distress was positively related to risky drinking days ($\beta = .29$, $p < .01$). Similar to the results of previous months, patients who had higher levels of emotional distress were more likely to engage in risky drinking. Emotional distress explained 7.2% of the variance in risky drinking days. In the final block, two interactions were found to be significant. One was the interaction between giving emotional support and emotional distress ($\beta = -.26$, $p < .05$). Figure 6 indicates that emotional distress was positively related to risky drinking days among patients giving only a low level of emotional support. On the other hand, the positive relationship was not significant among patients who provided a high level of emotional support. That is, giving emotional support decreased the positive relationship between emotional distress and risky drinking days.

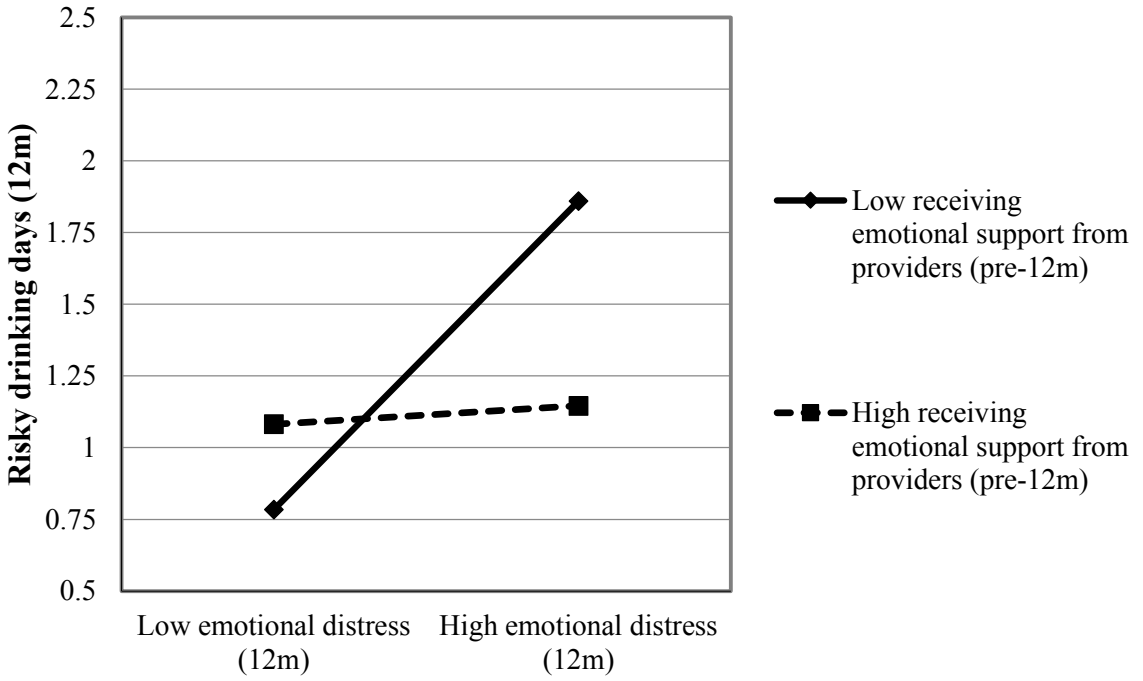

Figure 6. **Interaction between giving emotional support and emotional distress in predicting risky drinking days at 12 months**

Note. For illustration purpose, this study plotted using the means of the four subgroups: (1) low giving emotional support/low emotional distress; (2) low giving emotional support/high emotional distress; (3) high giving emotional support/low emotional distress; and (4) high giving emotional support/high emotional distress.

The other significant interaction was found between receiving emotional support from health care providers and emotional distress ($\beta = -.25$, $p < .05$). Emotional distress was related to increased risky drinking days for patients who received a low level of emotional support from health care providers, whereas it had no relationship with risky drinking days for those who received a high level of emotional support from health care providers (see Figure 7). In other words, receiving emotional support from health care providers countered emotional distress-induced heavy drinking. All interaction terms in this regression analysis explained 6.6% of the variance in risky drinking days.

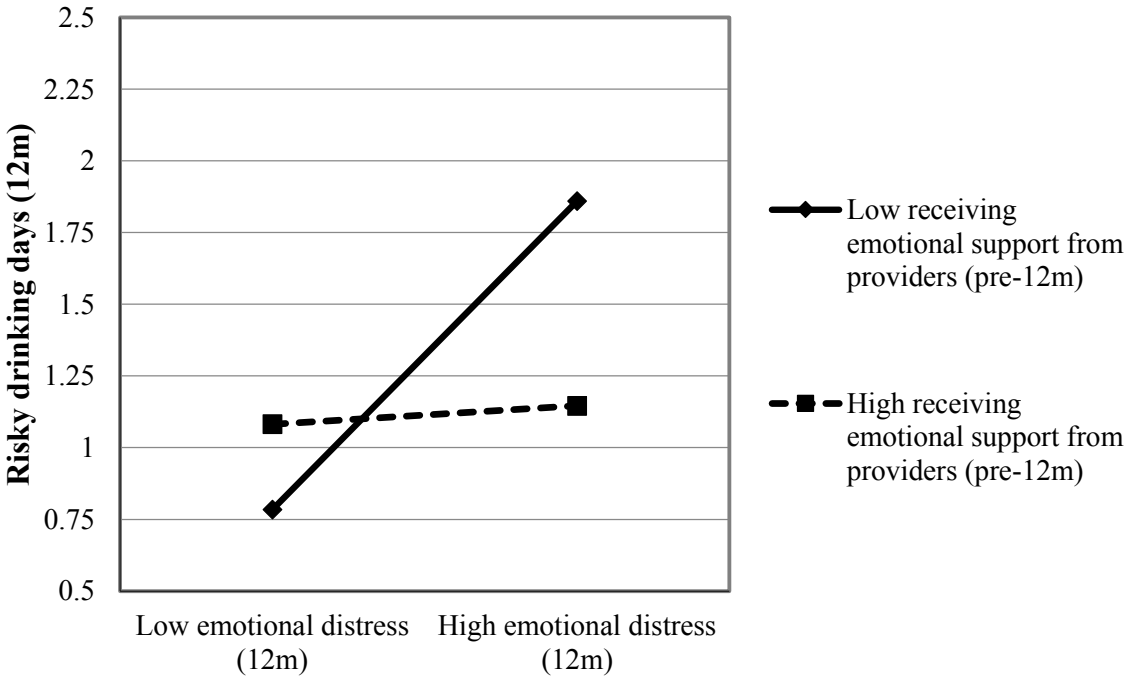

Figure 7. **Interaction between receiving emotional support from providers and emotional distress in predicting risky drinking days at 12 months**

Note. For illustration purpose, this study plotted using the means of the four subgroups: (1) low receiving emotional support from providers/low emotional distress; (2) low receiving emotional support from providers/high emotional distress; (3) high receiving emotional support from providers/low emotional distress; and (4) high receiving emotional support from providers/high emotional distress.

In this dissertation, Hypothesis 1 predicted the direct negative association between communicating emotional support and risky drinking days, suggesting that seeking emotional support (H1a), giving emotional support (H1b), receiving emotional support from peer patients (H1c), and receiving emotional support from health care providers (H1d) would be negatively associated with risky drinking days. Contrary to expectations, four activities of communicating emotional support had no negative relationships with risky drinking days during all three time periods. In addition, seeking emotional support was positively related to risky drinking days at 4 months. Therefore, Hypothesis 1 was not supported.

Hypothesis 2 proposed the stress-buffering effects of communicating emotional support on risky dinking days, suggesting that seeking emotional support (H2a), giving emotional support (H2b), receiving emotional support from peer patients (H2c), and receiving emotional support from health care providers (H2d) would weaken the positive relationship between emotional distress and risky drinking days. As expected, receiving emotional support from peer patients (8m), giving emotional support (12m), and receiving emotional support from health care providers (12m) contributed to preventing emotional distress-induced risky drinking. Thus, H2 was partially supported.

Model III: Mediating Roles of Coping Strategies

In the current study, Hypothesis 3 predicted mediating roles of coping strategies, suggesting that communicating emotional support would be positively related to coping strategies, and the coping strategies in turn would be negatively related to risky drinking days.

Table 14 summarizes the results from the structural equation modeling (SEM) to test the mediating roles of coping strategies in the relationship between communicating emotional support and risky drinking days at 8 months. The fitness indices of this model showed that the model fits the data very well, x^2 = .98 (5), p = .96, RMSEA = .00, CFI = 1.00, and SRMR = .01. This model explained 6.0%, 11.8%, 18.1%, 21.3%, 15.5%, and 16.2% of the variance in seeking emotional support, giving emotional support, receiving emotional support from peer patients, receiving emotional support from health care providers, coping strategies, and risky drinking days, respectively. Gender, education, living alone, using other drugs besides alcohol, the number of attempt to quit drinking, and longest period of sobriety were covariates, which significantly associated with endogenous variables.

Table 14

Structural Equation Model of Communicating Emotional Support, Coping Strategies, and Risky Drinking Days at 8 Months

	Communicating emotional support: Pretest - 4 months				**8 months**	**8 months**
	Seeking emotional support	Giving emotional support	Receiving emotional support from patients	Receiving emotional support from providers	Coping strategies	Risky drinking days
Age (γ)	-.11	-.03	.02	.03	-.02	-.03
Gender (female = 1) (γ)	.08	**.22****	**.40*****	**-.17***	-.16#	-.07
Employment (employed = 1) (γ)	.15#	.02	.12	-.11	.07	-.09
Education (γ)	-.13	-.16#	-.10	.08	**.18***	**.14#**
Living alone (yes = 1) (γ)	-.08	**.21****	.14#	-.08	-.01	-.11
Using other drugs besides alcohol (yes = 1) (γ)	.02	.03	.03	.16#	.04	**-.17***
Duration of drinking problems (years) (γ)	.02	-.11	.01	.15	-.07	-.06
Number of attempt to quit drinking (γ)	-.03	-.03	.10	**.27*****	**-.12**	-.11
Longest period of sobriety (days) (γ)	-.01	.10	-.08	**.23****	.06	-.05
Seeking emotional support (β)	-	-	-	-	**-.17***	-.02
Giving emotional support (β)	-	-	-	-	.01	.09
Receiving emotional support from patients (β)	-	-	-	-	**.23***	.08
Receiving emotional support from providers (β)	-	-	-	-	-.12	-.03
Coping strategies (β)	-	-	-	-		**-.34*****
R^2 (%)	6.0%	**11.8%***	**18.1%****	**21.3*****	**15.5%****	**16.2%****

Note: All coefficients are standardized gamma (γ) and beta (β). x^2 = .98(5), p = .96, RMSEA = .00, CFI = 1.00, and SRMR = .01. #p < .10, *p < .05, **p < .01, and ***p < .001.

Figure 8 displays the relationships of communicating emotional support with coping strategies and risky drinking days after controlling for the effects of covariates listed above. There were no significant effects for communicating emotional support on risky drinking days (seeking emotional support: $\beta = -.02$, $p = ns$; giving emotional support, $\beta = .09$, $p = ns$; receiving emotional support from peer patients: $\beta = .08$, $p = ns$; and receiving emotional support from health care providers: $\beta = -.03$, $p = ns$). Instead, two types of communicating emotional support had initial effects on coping strategies and, the coping strategies in turn were negatively associated with risky drinking days. Specifically, seeking emotional support was negatively related to coping strategies ($\beta = -.17$, $p < .05$) and coping strategies were negatively associated with risky drinking days ($\beta = -.34$, $p < .001$). In other words, patients who sought more emotional support were less likely to adopt coping strategies to help prevent risky drinking days. Thus, seeking emotional support might lead to increased risky drinking days through decreased coping strategies. For the indirect effect, seeking emotional support was found to exert a significant indirect effect on risky drinking days via coping strategies (standardized indirect effect = .06, $p < .05$). Contrary to seeking emotional support, receiving emotional support from peer patients was positively associated with coping strategies ($\beta = .23$, $p < .05$) and coping strategies were negatively associated with risky drinking days ($\beta = -.34$, $p < .001$). That is, patients who received more emotional support from peer patients were more likely to use coping strategies, which finally resulted in a reduced number of risky drinking days (standardized indirect effect = -.08, $p < .05$). In sum, coping strategies fully mediated the effects of seeking emotional support and receiving emotional support from peer patients on risky drinking days at 8 months.

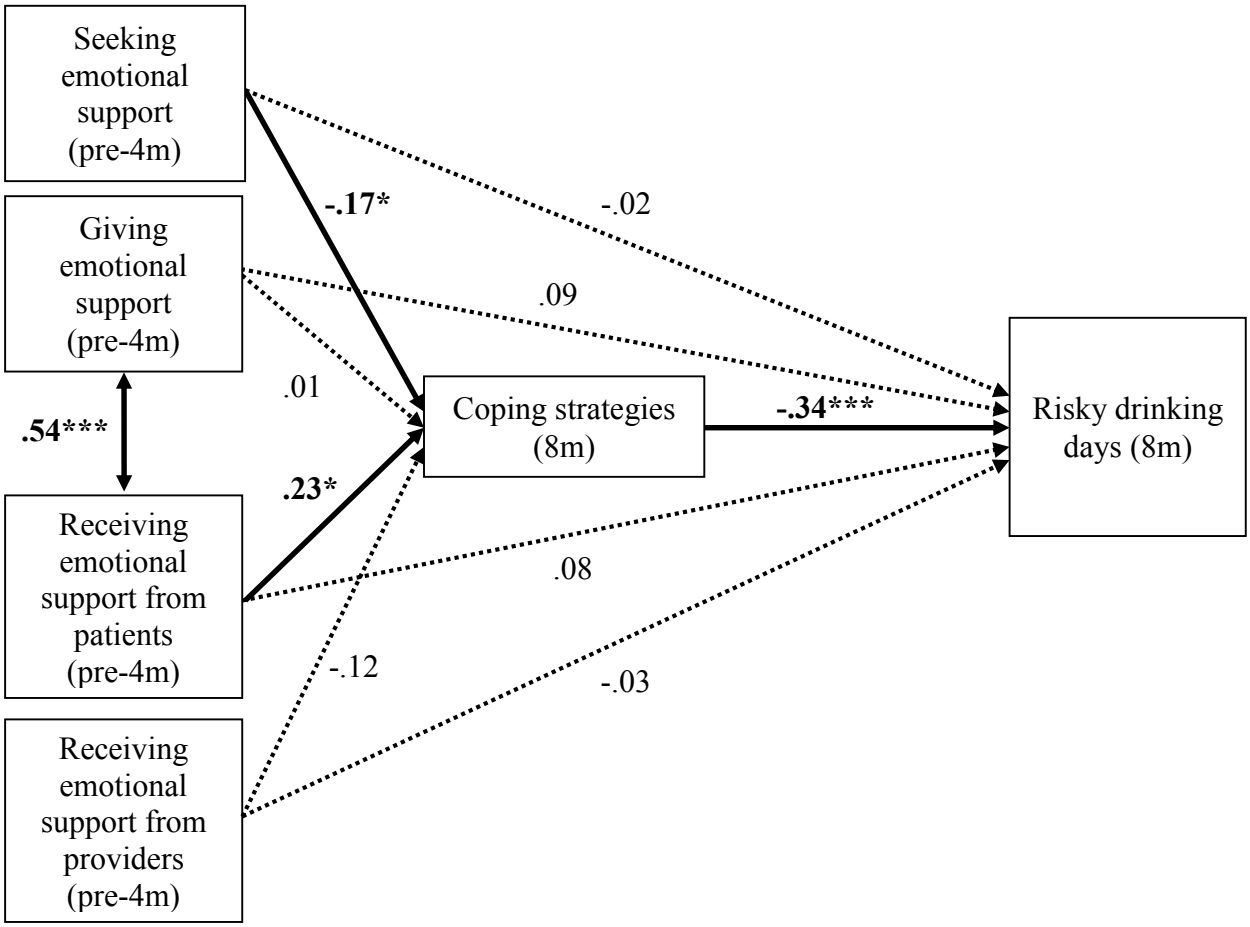

Figure 8. **Structural equation model of communicating emotional support, coping strategies, and risky drinking days at 8 months**

Note. All path coefficients are completely standardized. Covariate effects are not included in this figure.
* $p < .05$, *** $p < .001$.

Table 15 presents the findings and all structural parameters of structural equation model to examine the moderating roles of coping strategies in the relationship between communicating emotional support and risky dinking days at 12 months. Several goodness-of-fit statistics indicated that there is very good fit between this model and the data, x^2 = 2.20 (5), p = .82, RMSEA = .00, CFI = 1.00, and SRMR = .01. This model explained 6.4%, 12.0%, 15.9%, 22.9%, 14.2%, and 6.8% of the variance in seeking emotional support, giving emotional support, receiving emotional support from peer patients, receiving emotional support from health care providers, coping strategies, and risky drinking days, respectively. Regarding the effects of covariates, it was found that gender, education, living alone, using other drugs besides alcohol, the number of attempt to quit drinking, and longest period of sobriety had significant effects on endogenous variables.

Table 15

Structural Equation Model of Communicating Emotional Support, Coping Strategies, and Risky Drinking Days at 12 Months

	Communicating emotional support: Pretest - 8 months				**12 months**	**12 months**
	Seeking emotional support	Giving emotional support	Receiving emotional support from patients	Receiving emotional support from providers	Coping strategies	Risky drinking days
Age (γ)	-.14	-.03	.14	.06	-.13	.04
Gender (female = 1) (γ)	.09	**.19***	**.35*****	**-.17***	-.11	**.19***
Employment (employed = 1) (γ)	.14#	.01	.07	-.11	.06	-.03
Education (γ)	-.12	-.16#	-.09	.12	**.17***	-.04
Living alone (yes = 1) (γ)	-.09	**.23****	.10	-.07	-.11	-.05
Using other drugs besides alcohol (yes = 1) (γ)	-.01	.04	.07	**.19***	.00	-.03
Duration of drinking problems (years) (γ)	.03	-.12	-.14	.15	-.07	.001
Number of attempt to quit drinking (γ)	-.04	-.02	.09	**.28*****	-.11	-.02
Longest period of sobriety (days) (γ)	-.001	.11	-.04	**.23****	.05	-.07
Seeking emotional support (β)	-	-	-	-	-.12	-.04
Giving emotional support (β)	-	-	-	-	-.04	-.09
Receiving emotional support from patients (β)	-	-	-	-	**.27****	-.01
Receiving emotional support from providers (β)	-	-	-	-	-.03	-.06
Coping strategies (β)	-	-	-	-	-	.11
R^2 (%)	6.4%#	**12.0%***	**15.9%****	**22.9%*****	**14.2%****	6.8%#

Note: All coefficients are standardized gamma (γ) and beta (β). $x^2 = 2.20$ (5), $p = .82$, RMSEA = .00, CFI = 1.00, and SRMR = .01. #$p < .10$, *$p < .05$, **$p < .01$, and ***$p < .001$.

Figure 9 displays the relationships of communicating emotional support with coping strategies and risky drinking days after controlling for the effects of the aforementioned covariates. Only receiving emotional support from peer patients was positively related to coping strategies ($\beta = .27$, $p < .01$).

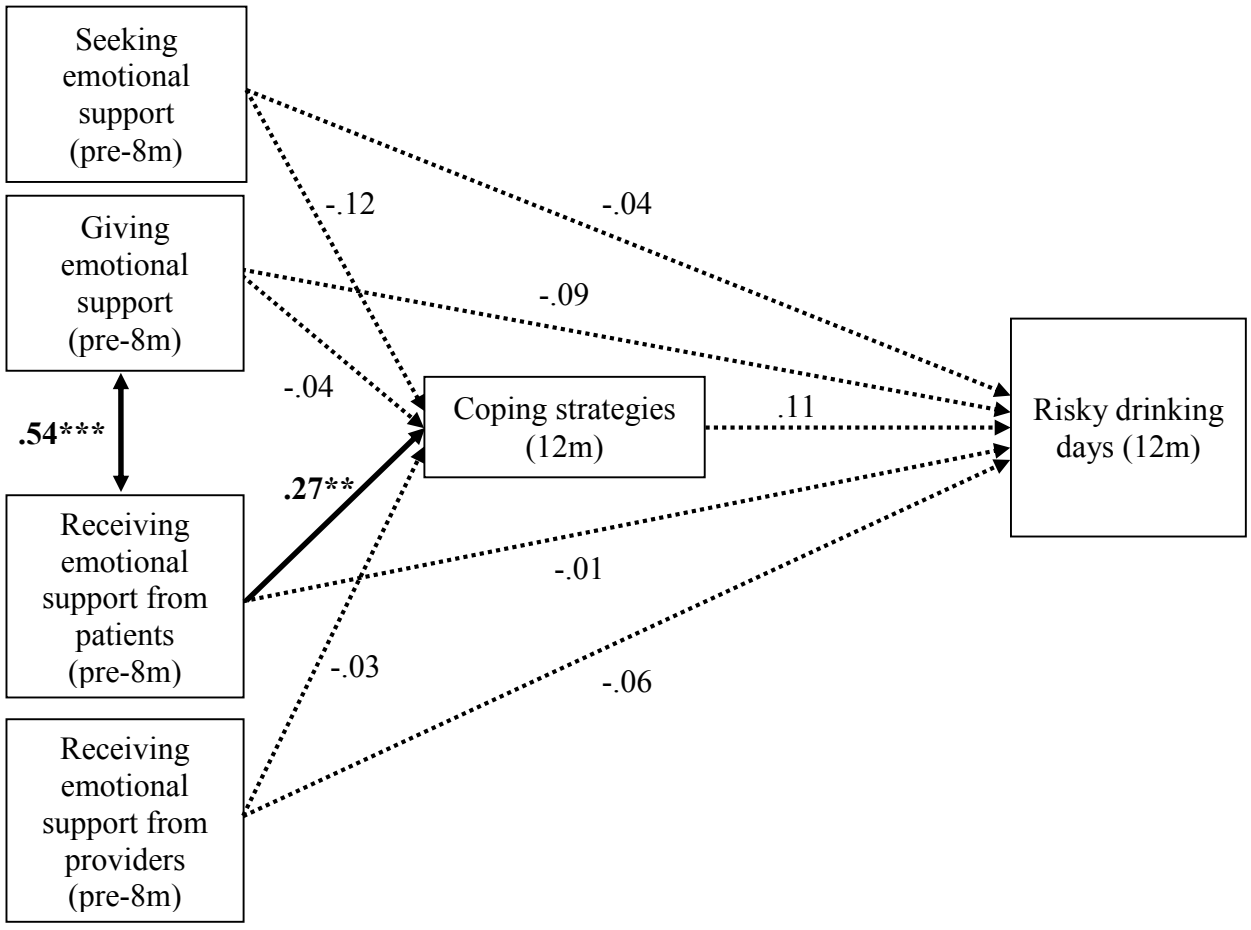

Figure 9. **Structural equation model of communicating emotional support, coping strategies, and risky drinking days at 12 months**

Note. All path coefficients are completely standardized. Covariate effects are not included in this figure.
** $p < .01$, *** $p < .001$.

In summary, coping strategies mediated the effects of seeking emotional support and receiving emotional support from peer patients on risky drinking days at 8 months. However, there were no mediating effects of coping strategies between communicating emotional support and risky drinking days at 12 months. Thus, Hypothesis 3 was partially supported.

Chapter 7: Discussion and Conclusion

This dissertation set out three research models to investigate the nature and benefits of communicating emotional support in smartphone-based support groups for people with alcohol use disorders. To reflect the dynamic process of supportive communication in social interactions, I specified four types of communicating emotional support - seeking it, giving it, receiving it from peer patients, and receiving it from health care providers.

Key Findings of Model I

From a comprehensive review of the literature on the determinants of several types of participation in online patient support groups, this study explored how patients' sociodemographic backgrounds, clinical information, and psychosocial characteristics predicted four types of communicating emotional support within smartphone-based alcoholism support groups. The results of testing the prediction model provide empirical support for the notion that each type of emotionally supportive communication is predicted by unique antecedents at all three time periods. Consistent with the findings of previous research, some demographic characteristics had predictive value in this research. First, gender differences were found to be very important in online supportive communication. More specifically, women alcoholics were more likely to provide emotional support for others and receive emotional support from peer alcoholics than were men alcoholics. On the contrary, men alcoholics were more likely to receive emotional support from health care providers than were their female counterparts.

There has been considerable interest in the difference between women and men regarding the extent to which they give and receive support. From a role theory perspective, providing social support can be viewed as role behavior, which is sustained and regulated by gender roles

(Eagly & Crowley, 1986). Traditionally, the female gender role includes norms encouraging certain forms of helping. Women's orientation is generally characterized as being caring and responsible (Gilligan, 1982) and women's consideration for others underlies their altruism (Piliavin & Unger, 1985; Underwood & Moore, 1982). Given that women generally have a tendency to be more empathic or sympathetic (Feshbach, 1982; Hoffman, 1977), they are expected to care for the personal and emotional needs of others, to deliver routine forms of personal advice, and to facilitate the progress of others toward their goals (Eagly & Crowley, 1986). Previous research has found that women are more likely than men to offer personal favors, emotional support, and informal counseling about personal issues in social relations (Aries & Johnson, 1983; Berg, 1984; F. L. Johnson & Aries, 1983). In addition, there is some evidence that women and men communicate differently their social support in online patient support groups. Klemm, Hurst, Dearholt, and Trone (1999) found that female patients provided more emotional support for other fellow patients, while male patients gave more informational support to fellow group members. Similarly, Seale, Ziebland, and Charteris-Black (2006) found that women patients were more likely to seek social and emotional support, whereas men patients were more likely to seek general information. Thus, women patients might be more likely to give emotional support than male patients in smartphone-based support groups for alcohol use disorders.

In addition, the gender differences in interpersonal relationships extend to supportive relationships. Women tend to value close relationships for their emotional and expressive qualities, while men mainly conceptualize close relationships in terms of their instrumental features (Tannen, 1990; Wood, 1993). From this perspective, women perceive that communication is the primary vehicle through which intimacy and connectedness are created and

maintained, while men view communication as a mechanism for getting things done, for accomplishing instrumental tasks, for conveying information, and for maintaining one's autonomy (Burleson, 2003). Adopting these differences in the context of supportive communication, female patients are highly interested in supportive conversations with peer patients, whereas male patients are highly involved in the supportive communication with health care providers. Accordingly, female alcoholics might be more likely to receive emotional support from peer patients in smartphone-based alcoholism support groups while male alcoholics might prefer receiving emotional support from health care providers.

Another significant predictor of giving emotional support in smartphone-based alcoholism support groups was found to be living condition. Some social scientists found that individualism was related to greater levels of prosocial behaviors, such as helping, giving, and volunteering behaviors (Allik & Realo, 2004; Conway, Ryder, Tweed, & Sokol, 2001) and such prosocial actions were more likely to take place in communities of individualists (Kemmelmeier, Jambor, & Letner, 2006). According to Waterman (1984), prosocial action for individualists is a matter of personal responsibility. In other words, not egotism but personal responsibility consonant with a desire to live one's life as an ethical actor seems to be the active ingredient of individualism, providing the basis for a prosocial orientation that is expressed as giving support and volunteering (Kemmelmeier et al., 2006).

In a similar vein, there is direct empirical evidence to support the notion that patients living alone are likely to provide social support for peer patients in online support groups. Prior studies found that patients living alone were more likely to engage in online cancer support groups by writing and/or reading messages (Han et al., 2012; E. Kim et al., 2011). Given that patients who live alone tend to post more messages in online support groups, Yoo and colleagues

(2013) investigated whether an individual living situation predicted the expression of emotional support messages in online support groups. Consistent with the results of this dissertation, they found that patients living alone were more likely than those living with others to give messages of emotional support.

Second, the findings of the prediction model confirm that some of the treatment and addiction-related factors are important predictors of communicating emotional support in smartphone-based support groups for people with alcohol use disorders. Interestingly, the clinical factors were found to predict only the reception of emotional support from health care providers among several types of supportive communication. Patients using other drugs besides alcohol were more likely to receive emotional support from health care providers. Using a particular drug is associated with a marked increase in the probability of using any other drugs because there is a shared or common vulnerability factor in using a range of illicit drugs (Tsuang et al., 1998). Thus, the use of other drugs could make alcohol-dependent people more vulnerable to alcohol relapse, and consequently might increase the capacity to receive help, recommendations, or support from experts in drug and alcohol addiction treatment.

Additionally, the number of attempt to quit drinking and longest period of sobriety were predictive of receiving emotional support from health care providers. In accordance with DSM-IV criteria for alcohol dependence, one of the characteristics that alcohol-dependent people have in common is a persistent desire or a history of futile attempts to cut down or stop drinking (Dawson, 2000). However, previous attempts at quitting and the duration of abstinence have been found to lead, ironically, to relapse among individuals with addictive disorders (Ferguson et al., 2003; Norregaard, Tonnesen, & Petersen, 1993; Stapleton et al., 1995). In this sense, alcoholics who have made more attempts to quit drinking are more likely to try quitting again,

and those whose previous periods of abstinence have lasted longer are more likely to completely stop drinking. Taken together, it is likely that these alcoholics have strong desires and intentions to quit drinking alcohol, which make them pay attention to or adopt professional support and advice. In a similar vein, alcoholic patients with a higher number of attempt to quit drinking or a longer period of sobriety might be more likely to receive emotional support from health care providers in smartphone-based alcoholism support groups.

Key Findings of Model II

Based on the direct and stress-buffering models of social support (S. Cohen, Gottlieb, et al., 2000; S. Cohen & Wills, 1985), this dissertation examined whether communicating emotional support in smartphone-based alcoholism support groups contributed to recovery from alcohol use disorders. In terms of the direct effects model of social support, I proposed that seeking, giving, and receiving emotional support are directly related to reduced risky drinking. Contrary to my expectations, however, there were no direct relationships between communicating emotional support and reduced risky drinking days at 4, 8, and 12 months. Moreover, seeking emotional support was found to have a positive relationship with heavy alcohol use at 4 months. Alcoholic patients who sought more emotional support were more likely to drink alcohol heavily. Although much of the literature on social support demonstrates the positive outcomes of social support, my result is not a great surprise. According to Barrera (1986), seeking social support may not always be beneficial. For the reception of social support, the recipients have to accept the risks of seeking support. For example, they often have to reveal stigmatizing or undesirable information in order to enable support to be provided (Brashers, Neidig, & Goldsmith, 2004). They may also suffer fear of negative evaluations for having to rely

on others (DePaulo & Fisher, 1980). That is, there are risks associated with making oneself vulnerable in mobilizing the enactment of support provision. These risks might lead alcoholics who sought more emotional support to drink more alcohol.

This research also tested the stress-buffering roles of communicating emotional support in smartphone-based alcoholism support groups. Drawing on the stress-buffering model of social support, I predicted that seeking, giving, and receiving emotional support act primarily as buffers to protect alcoholics from the harmful effect of emotional distress. It could be argued that alcoholic patients who are more likely to communicate emotional support are more resistant to the emotional distress that elicits alcohol craving and even relapse. Consequently, they are more likely to maintain sobriety or they are less likely to drink alcohol heavily even if they experience emotional distress. As expected, the results of this study support the stress-buffering functions of giving and receiving emotional support in preventing risky drinking days at certain points. Inevitably, emotional distress was positively related to risky drinking days, but no positive association was found among alcoholic patients who received higher levels of emotional support from peer patients during the 8-month follow-up period. Likewise, the positive relationship between emotional distress and risky drinking days was found to be non-significant among those who gave higher levels of emotional support over the 12-month study period. During the same period, those who received higher levels of emotional support from health care providers reported slightly reduced risky drinking days even though they experienced greater emotional distress. In brief, giving and receiving emotional support were shown to act as significant buffers in the preventing of emotional distress-induced risky drinking.

These findings lead me to conclude that communicating emotional support contributes to successful alcoholism treatment not by producing direct benefits per se but by alleviating or

changing the effect of emotional distress to trigger alcohol consumption. In support of this conclusion, the direct model of social support tends to be significant when the support is conceptualized in structural terms, such as social integration. The stress-buffering model of social support are found to be significant more often when measuring the functions of support or satisfaction with support (S. Cohen & Wills, 1985).

Another interesting finding of this dissertation is that seeking social support might play a stress-exacerbation role in alcoholism treatment. In the direct model of communicating emotional support, I found a positive relationship between seeking emotional support and risky drinking days at 4 months – a result diametrically opposed to my expectation. Similarly, seeking emotional support showed an unexpected result in the stress-buffering model. It was found to strengthen the positive relationship between emotional distress and risky drinking at 4 months. Alcoholic patients who sought higher levels of emotional support were more likely to consume alcohol excessively when they experienced greater emotional distress. In other words, seeking emotional support not decreased but actually increased risky drinking when alcoholics experienced emotional distress.

One possible explanation for this result pertains to the avoidance factors of seeking emotional support. Research has identified some factors that inhibit individuals from seeking psychological support, such as the desire to avoid discussing distressing or personal information (Cepeda-Benito & Short, 1998; Kelly & Achter, 1995; Vogel & Wester, 2003) and the desire to avoid experiencing painful feelings (Komiya, Good, & Sherrod, 2000). Nevertheless, patients who feel compelled to seek emotional support may undergo different types of stress in the search itself. For example, a person seeking emotional support must often divulge distressing or emotional information (Keith-Lucas, 1994), leading to feelings of vulnerability; the person must

consider the potential risk of being hurt further if they feel "misunderstood … judged, or even ignored when they self-disclose" (Harris, Dersch, & Mittal, 1999, p. 407). In the process of seeking emotional support, the burden of having to talk about emotionally distressing material might lead to psychological distress. In addition, patients seeking social support experience a variety of concerns, including reservations, and hesitations about the quality and effectiveness of support they would receive from others (Akey, Rintamaki, & Kane, 2013). For these reasons, seeking social support can create emotional distress in its own right that can lead, paradoxically, to excessive alcohol consumption.

Key Findings of Model III

The last aim of this dissertation was to provide the understanding of the mechanisms underlying the beneficial effects of communicating emotional support in smartphone-based alcoholism support groups. Stress and coping theories suggest that social support helps an individual cope better with problems (Thoits, 1986; Wills, 1985; Wills & Filer, 1996). Based on this notion, this study proposed the mediation model of coping where coping strategies were hypothesized to mediate the relationship between communicating emotional support and alcoholic patients' risky drinking at all three time periods. At 8 months, a mediation analysis showed that coping strategies at least mediated the effects of seeking emotional support and receiving emotional support from peer patients. As expected, receiving emotional support from peer patients was significantly related to coping strategies, which in turn resulted in decreased risky drinking days among individuals with alcohol dependence. Because there was no relation between receiving emotional support from peer patients on risky drinking days, it is conceivable that the reception behavior led to a reduction of alcohol abuse by promoting the adoption of

coping strategies. At 12 months, however, the mediation analyses yielded no mediating effects of coping strategies.

Consonant with these findings about the direct and stress-buffering models of seeking emotional support, seeking emotional support played a harmful role rather than a helpful role in the mediation model of coping strategies for preventing risky drinking. Seeking emotional support led to lower levels of coping strategies, which finally resulted in increased risky drinking days. According to Folkman and Lazarus (1980), seeking emotional support is associated with emotion-focused coping which engages in distracting activities, using alcohol or drugs, to ameliorate the negative emotions associated with the problem. Thus, alcoholics who seek emotional support are likely to use alcohol to cope with stressful situations.

Seeking support inherently involves an admission of ignorance and the need for assistance. That is, seeking support threatens one's sense of independence (A. M. Ryan, Shim, Lampkins-uThando, Kiefer, & Thompson, 2009). Thus, individuals suffering from such chronic illnesses as alcoholism may avoid seeking social support if doing so threatens their independence. This risk of seeking support is particularly deleterious for independent (autonomous). Independent patients distinguish themselves as people who do not rely much on others (Reevy & Maslach, 2001). Thus, they can be averse to seeking emotional support when sought, reveal emotional vulnerability. For this reason, they presumably do not seek support as often as other patient do. Instead, they may try to deal with stressful situations on their own coping strategies.

Conversely, patients with a dependent personality orientation are likely to seek others' assistance. There is evidence pertaining to the relation between dependent personality and help-seeking behavior (Bornstein, 1992, 1998). Highly dependent people are prone to relinquishing control over their personal fate and engaging in dependent help-seeking (Nadler, 1997). It is thus

plausible that alcoholic patients seeking emotional support were more likely to rely on others rather than to facilitate their own coping efforts for preventing excessive alcohol use.

Of course, the above interpretation may be inappropriate to draw a universal conclusion on the relation between seeking emotional support and personality. A variety of personality traits play important roles in almost every aspect of the coping process resulted from seeking social support. They have been linked to the likelihood of engaging in certain coping strategies (David & Suls, 1999; O'Brien & DeLongis, 1996; Watson & Hubbard, 1996) and the effectiveness or outcomes of these coping strategies (Bolger & Zuckerman, 1995; Gunthert, Cohen, & Armeli, 1999). For example, because self-confident patients are not timid, they may be more likely than less self-confident people to seek support from others with whom they have nonintimate relationships (Reevy & Maslach, 2001). A patient who is highly competent and autonomous can seek out help, advice, or the solution to a problem from any of support resources available in online support groups (Gustafson et al., 2008). In other words, they may be inclined to seek support if they think that it is in their best interest to do so.

Implications

Theoretical implications. In the context of online support groups for people with chronic health conditions, a vast majority of the literature concerns the sundry benefits of supportive communication. This dissertation, however, is not merely an extension of previous works. By addressing critical shortcomings of earlier studies, this research makes some theoretical contributions. First, it identifies the four types of communicating emotional support: (1) seeking emotional support, (2) giving emotional support, (3) receiving emotional support from peer patients, and (4) receiving emotional support from health care providers. To my

knowledge, most previous studies have focused on giving and/or receiving social support in online patient support groups. Thus, their findings fell short of fully reflecting the complex and reciprocal nature of supportive communication. However, this study elaborates a more in-depth understanding of communicating emotional support by proposing more segmented components of supportive communication. Furthermore, this research systematically is capable of comparing the features and effectiveness of the four communication behaviors related to emotional support.

Second, the three research models examined in this dissertation offer a more comprehensive explanation of the roles of communicating emotional support in smartphone-based alcoholism support groups. Although the results rejects some of the hypotheses proposed by these models, this research can be an important starting point for applying theory-driven approaches to understanding the communication of social support via mobile communication devices. More specifically, the prediction model helps us understand who are more likely to seek, give, and receive emotional support in terms of demographic backgrounds, clinical information, and psychosocial characteristics. As the next step, the direct and buffering models reveal whether the four types of communicating emotional support are effective at preventing risky drinking among people with alcohol use disorders. Finally, the mediation model of coping strategies allows for a better understanding of the coping mechanism through which communicating emotional support leads to reduced risky drinking among individuals with alcohol dependence.

The final contribution lies in the study's providing of more insights into integrated theory and knowledge development for online social support and communication research. Despite a variety of disciplines having extensively explored social support, no effort has been made to collate and synthesize all the potentially relevant frameworks to interpret the nature and effects of communicating social support in online support groups. To shed some light on this issue, this

study employed several theoretical approaches and empirical evidence that might contribute to a current understanding of supportive communication in smartphone-based alcoholism support groups. As overarching theoretical grounds that fully account for the features and benefits of supportive communications in online support groups, the study used extant theories from the areas of social support and computer-mediated communication (CMC) research. Building on message expression- and reception-effects paradigms, I also distinguished the effects of writing and reading in online environments. Taken together, this research contributes to developing a more integrated theoretical framework to provide one or more lenses through which online supportive communication is viewed.

Methodological implications. To investigate the feature and potential benefits of communicating emotional support in smartphone-based support groups, this dissertation utilized a computational and conventional social science approach. Earlier research on online support groups has employed simple word-counting programs to explore messages communicated among the group participants. However, most textual analysis software used in past studies could not adequately handle the complexities of the natural language process. Additionally, supportive communication can be considered in simplistic terms as the expressing and receiving of supportive messages, as both elements must be present for communication to take place. Therefore, supportive communication should be investigated in a combination of the expression and reception of supportive messages.

This dissertation could objectively measure and distinguish message reception as well as expression by analyzing the use of hyperlinks and keystrokes, though doing so required a sophisticated methodological approach. This methodology is demonstrated by combining the

following three data sets: (1) support group messages, (2) action log data (record of users' interaction with A-CHESS system, including support groups), and (3) longitudinal survey data. To summarize, I first conducted a computer-aided content analysis of messages posted to support groups, using Provalis Research's QDA Miner 4.1 and WordStat 6.1. These applications help deal with the syntactical complexities of natural language. These codings were combined with group participants' action log data and survey data. This approach allows for not only exploring multi-dimensional communications occurring within smartphone-based alcoholism support groups but also tracking what each patient wrote or read. In addition, this type of granular analysis has distinct advantages when comparing the effects of several forms of supportive communication. Lastly, this move toward computational methods is necessary to more carefully test theories of influence by handling a large amount of data generated from online support groups.

Practical implications. Providing practical guidelines to mHealth intervention developers, clinicians, and researchers, the main findings of this dissertation shed light on how to design, implement, and evaluate successful mobile health communication interventions. According to the prediction model of communicating emotional support, female patients were likely to prefer the supportive communication with peer patients, while male patients seemed to prefer the supportive communication with health care providers. In addition to gender, this study found the use of other drugs besides alcohol, the number of attempt to quit drinking, and longest period of sobriety as important clinical information to predict the reception of emotional support from health care providers. Such treatment and addiction-related information might increase alcoholic patients' needs for emotional support from health care professionals. From these

findings, it is possible to claim that the preferred source of communicating social support differs according to gender and a patient's clinical characteristics. Thus, support group developers must carefully consider gender differences and clinical characteristics when designing the combination of patients and health care professionals to reap potential benefits from supportive communication in smartphone-based alcoholism support groups.

It was also found that alcoholic patients living with others were less likely to give emotional support than were those living alone. Patients living with others might exchange enough support from their pre-existing social networks and thus they might be less motivated to turn to smartphone-based support groups as an alternative way of communicating emotional support in face-to-face interactions. Nevertheless, we cannot overlook the potential benefit of giving emotional support. It has often been noted that giving social support may be more beneficial than receiving it in social interactions (S. L. Brown et al., 2003). Therefore, clinicians and researchers should develop strategies to encourage alcoholics living with others to engage in supportive communication in smartphone-based alcoholism support groups. One possible strategy is to consider the involvement of patients and their significant or supportive others (e.g., family and friends) in smartphone-based support groups. These individuals could be integral communicators in such interventions. They could help stimulate ongoing supportive communications.

Another remarkable finding from this study for its practical implications is that the seeking of emotional support yielded harmful effects in the treatment of alcoholism. It not only was directly related to a high level of risky drinking but also amplified the positive relationship between emotional distress and risky drinking. Additionally, seeking emotional support increased risky drinking by decreasing coping strategies. However, seeking emotional support

may not be inherently harmful. Obviously, alcoholics who are desperate and have a high level of intention to abstain from consuming alcohol will be more likely to reach out for support. As detailed above, because of perceived risks of seeking emotional support, seeking emotional support may often be ineffective, and even possibly deleterious. Thus, it is important for clinicians to help patients reduce or prevent the risks that may occur in the process of seeking emotional support. For example, it is worth considering providing additional patient education and counseling on privacy concerns before patients participate in smartphone-based support groups. Given that seeking support may affect not only the likelihood of achieving recovery but also the likelihood of maintaining recovery (Dawson, Grant, Stinson, & Chou, 2006), it is imperative that the addiction recovery community addresses the potential barriers to the benefits of seeking emotional support.

Limitations and Future Directions

Although this study was designed to address the significant limitations of previous research on supportive communication in online support groups, it also has noteworthy limitations that suggest directions for further investigation. First, it should be noted that this research did not consider differences in the ways of seeking support when testing the role of seeking emotional support. Some scholars have identified two features of seeking support between partial and complete requests for support (Asser, 1978; Butler & Neuman, 1995; Nelson-Le Gall, 1985). Applying this distinction to support-seeking behaviors, Nadler (1997) defined two styles of seeking social support such as autonomous seeking and dependent seeking. When seeking support, a patient with an autonomous perspective may approach others and ask them to provide him or her with the means with which to solve the problem on his or her own.

Alternatively, a patient who prefers dependent seeking may ask others to provide him or her with a complete solution to the problem at hand. Additionally, this research did not examine the source of seeking emotional support in which alcoholic patients engaged. Similar to receiving support, patients' needs and intentions of seeking support differ significantly in terms of sources from which they seek support (Ullman & Najdowski, 2010). From this perspective, the source of emotional support can be an important factor in determining the engagement and function of seeking emotional support. Due to these methodological concerns, it might be impossible to observe a beneficial role of seeking emotional support in preventing risky drinking among individuals with alcohol dependence. Therefore, future study is needed to consider an appropriate measure for properly capturing features of seeking emotional support.

Another limitation is that this research did not reflect the unique features of emerging smartphone technology. Although several capabilities of smartphone technology offer various channels for communicating social support online, this study focused on supportive communication in only online bulletin board-formatted discussion groups accessible through patients' smartphones. This approach may exhibit the misconception that an mHealth application is a smaller version of a website. However, the strengths of the mobile platform – time and location sensitivity, anywhere access, push capabilities and so forth (Isham, Shaw, & Gustafson, 2013) – help patients enlarge their social network for communicating social support beyond online support groups. For instance, mobile email and text messaging allow for rapid, asynchronous communication within patients' social network (Bryant, Sanders-Jackson, & Smallwood, 2006). Recent studies show the efficacy of mobile smartphone communication applications in alcoholism treatment (Agyapong, Ahern, McLoughlin, & Farren, 2012; Cohn et

al., 2011; Gustafson et al., 2014). Therefore, future research should attempt to replicate the findings using different types of smartphone communication applications.

Finally, this research pays special attention to a limitation that might stem from the absence of time-difference between coping strategies and risky drinking days in the mediation model of coping. Because a mediation model is composed of causal processes that unfold over time, cross-sectional approaches to mediation typically may lead to substantially biased estimates of longitudinal parameters (Maxwell & Cole, 2007). Because of this limitation, the results of mediation model tested in this study should be interpreted with some circumspection. In the mediation model, relevant variables can also exert reciprocal influence rather than expecting causality to flow exclusively in one direction. Thus, an inevitable recommendation for further research is to untangle the possible associations based on a solid theoretical foundation and empirical evidence.

Conclusions

This dissertation has been aimed at offering further understanding of communicating social support online. The vast majority of online social support research has examined the nature and effects of communicating social support in computer-mediated support groups accessible through desktop devices. However, the rapid evolution of information and communication technologies (ICTs) continually demands theoretical and empirical investigations on emerging areas of online social support research. This is the first scholarly endeavor to address new research needs in the field of mHealth by investigating the nature and effects of communicating emotional support in smartphone-based support groups. It is particularly notable that this study is dedicated to developing unique methods (analytic method for online supportive

communication), researching unique clinical populations (people with alcohol use disorders), and theorizing of unique effects (message expression and reception effects).

As a result, these efforts should contribute to broadening our knowledge of common features and the potential roles of communicating emotional support in smartphone-based alcoholism support groups. Specifically, this study provides a number of key insights into who are more likely to communicate emotional support, what benefits or drawbacks are likely to result from communicating emotional support, and how communicating emotional support contributes to alcoholism treatment. Taken together, I would certainly argue that communicating social support in smartphone-based alcoholism support groups is not parsimonious but somewhat complicated and comprehensive. I hope this dissertation helps identify the factors that need to be considered when researching the communication of online social support in public health research and practice.

References

Abroms, L. C., & Maibach, E. (2008). The effectiveness of mass communication to change public behaviors. *Annual Review Public Health, 29*, 219-234.

Agyapong, V. I. O., Ahern, S., McLoughlin, D. M., & Farren, C. K. (2012). Supportive text messaging for depression and comorbid alcohol use disorder: Single-blind randomised trial. *Journal of Affective Disorders, 141*(2), 168-176.

Akechi, T., Okamura, H., Yamawaki, S., & Uchitomi, Y. (1998). Predictors of patients' mental adjustment to cancer: patient characteristics and social support. *British Journal of Cancer, 77*(12), 2381-2385.

Akey, J. E., Rintamaki, L. S., & Kane, T. L. (2013). Health Belief Model deterrents of social support seeking among people coping with eating disorders. *Journal of Affective Disorders, 145*(2), 246-252.

Albrecht, T. L., & Adelman, M. B. (1987). Rethinking the relationship between communication and social support: An introduction. In T. L. Albrecht & M. B. Adelman (Eds.), *Communicating social supprot* (pp. 13-16). Newbury Park, CA: Sage.

Albrecht, T. L., & Goldsmith, D. J. (2003). Social support, social networks, and health. In T. L. Thompson, A. M. Dorsey, K. I. Miller & R. Parrott (Eds.), *Handbook of health communication* (pp. 263-284). Mahwah, NJ: Lawrence.

Alexander, S. C., Peterson, J. L., & Hollingshead, A. B. (2003). Help is at your keyboard: Support groups on the Internet. In L. R. Frey (Ed.), *Group communication in context: Study of bona fide groups* (2nd ed., pp. 309-334). London, UK: Lawrence Erlbaum Associates.

Alison Bryant, J., Sanders-Jackson, A., & Smallwood, A. M. K. (2006). IMing, text messaging, and adolescent social networks. *Journal of Computer-Mediated Communication, 11*(2), 577-592.

Allik, J., & Realo, A. (2004). Individualism-collectivism and social capital. *Journal of Cross-Cultural Psychology, 35*(1), 29-49.

Ancker, J. S., Carpenter, K. M., Greene, P., Hoffman, R., Kukafka, R., Marlow, L. A. V., . . . Quillin, J. M. (2009). Peer-to-peer communication, cancer prevention, and the Internet. *Journal of Health Communication, 14*(Suppl 1), 38-46.

Ankolekar, A., Szabo, G., Luon, Y., & Huberman, B. A. (2010). Friendlee: A mobile application for your social life. In T. Phan, R. Montanari & P. Zerfos (Eds.), *Mobile computing, applications, and services* (Vol. 35, pp. 331-334). Heidelberg, Germany: Springer.

Antheunis, M. L., Schouten, A. P., Valkenburg, P. M., & Peter, J. (2012). Interactive uncertainty reduction strategies and verbal affection in computer-mediated communication. *Communication Research, 39*(6), 757-780.

Aries, E. J., & Johnson, F. L. (1983). Close friendship in adulthood: Conversational content between same-sex friends. *Sex Roles, 9*(12), 1183-1196.

Armes, J., Crowe, M., Colbourne, L., Morgan, H., Murrells, T., Oakley, C., . . . Richardson, A. (2009). Patients' supportive care needs beyond the end of cancer treatment: A prospective, longitudinal survey. *Journal of Clinical Oncology, 27*(36), 6172-6179.

Arora, N. K., Finney Rutten, L. J., Gustafson, D. H., Moser, R., & Hawkins, R. P. (2007). Perceived helpfulness and impact of social support provided by family, friends, and health care providers to women newly diagnosed with breast cancer. *Psycho-Oncology, 16*(5), 474-486.

Asser, E. S. (1978). Social class and help-seeking behavior. *American Journal of Community Psychology, 6*(5), 465-475.

Bambina, A. (2007). *Online social support: The interplay of social networks and computer-mediated communication*. Youngstown, NY: Cambria Press.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191-215.

Barbee, A. P., Cunningham, M. R., Winstead, B. A., Derlega, V. J., Gulley, M. R., Yankeelov, P. A., & Druen, P. B. (1993). Effects of gender role expectations on the social support process. *Journal of Social Issues, 49*(3), 175-190.

Bargh, J. A., McKenna, K. Y. A., & Fitzsimons, G. M. (2002). Can you see the real me? Activation and expression of the "true self" on the Internet. *Journal of Social Issues, 58*(1), 33-48.

Barrera, M. (1986). Distinctions between social support concepts, measures, and models. *American Journal of Community Psychology, 14*(4), 413-445.

Beattie, M. C., & Longabaugh, R. (1999). General and alcohol-specific social support following treatment. *Addictive Behaviors, 24*(5), 593-606.

Beattie, M. C., Longabaugh, R., Elliott, G., Stout, R. L., Fava, J., & Noel, N. E. (1993). Effect of the social environment on alcohol involvement and subjective well-being prior to alcoholism treatment. *Journal of Studies on Alcohol and Drugs, 54*(3), 283-296.

Bender, J. L., Jimenez-Marroquin, Maria-Carolina., & Jadad, A. R. (2011). Seeking support on facebook: A content analysis of breast cancer groups. *Journal of Medical Internet Research, 13*(1), e16.

Berg, J. H. (1984). Development of friendship between roommates. *Journal of Personality and Social Psychology, 46*(2), 346-356.

Berglund, M., & Ojehagen, A. (2006). The influence of alcohol drinking and alcohol use disorders on psychiatric disorders and suicidal behavior. *Alcoholism: Clinical and Experimental Research, 22*(S7), 333S-345S.

Blumler, J, G., & Katz, E. (1974). *The uses of mass communications: Current perspectives on gratifications research.* Beverly Hills, CA: Sage Publications

Boehmer, S., Luszczynska, A., & Schwarzer, R. (2007). Coping and quality of life after tumor surgery: Personal and social resources promote different domains of quality of life. *Anxiety, Stress, and Coping, 20*(1), 61-75.

Bolger, N., & Schilling, E. A. (1991). Personality and the problems of everyday life: The role of neuroticism in exposure and reactivity to daily stressors. *Journal of Personality, 59*(3), 355-386.

Booth, B. M., Loveland Cook, C. A. , & Blow, F. C. (1992). Comorbid mental disorders in patients with AMA discharges from alcoholism treatment. *Psychiatric Services, 43*(7), 730-731.

Booth, B. M., Russell, D. W., Soucek, S., & Laughlin, P. R. (1992). Social support and outcome of alcoholism treatment: An exploratory analysis. *The American Journal of Drug and Alcohol Abuse, 18*(1), 87-101.

Bornstein, R. F. (1992). The dependent personality: Developmental, social, and clinical perspectives. *Psychological Bulletin, 112*(1), 3-23.

Bornstein, R. F. (1998). Implicit and self-attributed dependency strivings: Differential relationships to laboratory and field measures of help seeking. *Journal of Personality and Social Psychology, 75*(3), 778-787.

Boucher, E. M., Hancock, J. T., & Dunham, P. J. (2008). Interpersonal sensitivity in computer-mediated and face-to-face conversations. *Media Psychology, 11*(2), 235-258.

Boulos, M. N. K., Wheeler, S., Tavares, C., & Jones, R. (2011). How smartphones are changing the face of mobile and participatory healthcare: an overview, with example from eCAALYX. *Biomedical Engineering Online, 10*(1), 24.

Braithwaite, D. O., Waldron, V. R., & Finn, J. (1999). Communication of social support in computer-mediated groups for people with disabilities. *Health Communication, 11*(2), 123-151.

Brashers, D. E., Neidig, J. L., & Goldsmith, D. J. (2004). Social support and the management of uncertainty for people living with HIV or AIDS. *Health Communication, 16*(3), 305-331.

Broome K. M., Simpson, D. D., & Joe, G. W. (2002). The role of social support following short-term inpatient treatment. *The American Journal of Addictions, 11*(1), 57-65.

Brown, S. A., Vik, P. W., McQuaid, J. R., Patterson, T. L., Irwin, M. R., & Grant, I. (1990). Severity of psychosocial stress and outcome of alcoholism treatment. *Journal of Abnormal Psychology, 99*(4), 344-348.

Brown, S. L., Nesse, R. M., Vinokur, A. D., & Smith, D. M. (2003). Providing social support may be more beneficial than receiving it results from a prospective study of mortality. *Psychological Science, 14*(4), 320-327.

Brown, S. L., & Vinokur, A. D. (2003). The interplay among risk factors for suicidal ideation and suicide: The role of depression, poor health, and loved ones' messages of support and criticism. *American Journal of Community Psychology, 32*, 131-141.

Bryant, J. A., Sanders-Jackson, A., & Smallwood, A. M. K. (2006). IMing, text messaging, and adolescent social networks. *Journal of Computer-Mediated Communication, 11*(2), 577-592.

Bui, L. L., Last, L., Bradley, H., Law, C. H. L., Maier, B.-A., & Smith, A. J. (2002). Interest and participation in support group programs among patients with colorectal cancer. *Cancer Nursing, 25*(2), 150-157.

Burleson, B. R. (2003). The experience and effects of emotional support: What the study of cultural and gender differences can tell us about close relationships, emotion, and interpersonal communication. *Personal Relationships, 10*(1), 1-23.

Butler, R. , & Neuman, O. (1995). Effects of task and ego achievement goals on help-seeking behaviors and attitudes. *Journal of Educational Psychology, 87*(2), 261-271.

Cappell, H., & Greeley, J. (1987). Alcohol and tension reduction: An update on research and theory In H. T. Blane & K. E. Leonard (Eds.), *Psychological theories of drinking and alcoholics* (pp. 15-54). New York, NY: Guilford Press.

Carpenter, K. M., & Hasin, D. S. (1999). Drinking to cope with negative affect and DSM-IV alcohol use disorders: A test of three alternative explanations. *Journal of Studies on Alcohol and Drugs, 60*(5), 694-704.

Cassel, J. C. (1976). The contribution of the social environment to host resistance. *American Journal of Epidemiology, 104*(2), 107-123.

Cella, D. F., & Yellen, S. B. (1993). Cancer support groups: The state of the art. *Cancer Practice, 1*(1), 56-61.

Cepeda-Benito, A., & Short, P. (1998). Self-concealment, avoidance of psychological services, and perceived likelihood of seeking professional help. *Journal of Counseling Psychology, 45*(1), 58-64.

Chaffee, S. H., & Schleuder, J. . (1986). Measurement and effects of attention to media news. *Human Communication Research 13*(1), 76-107.

Chih, M.-Y., Patton, T., McTavish, F. M., Isham, A. J., Judkins-Fisher, C. L., Atwood, A. K., & Gustafson, D. H. (2014). Predictive modeling of addiction lapses in a mobile health application. *Journal of Substance Abuse Treatment, 46*(1), 29-35.

Cho, J., Shah, D. V., McLeod, J. M., McLeod, D. M., Scholl, R. M., & Gotlieb, M. R. (2009). Campaigns, reflection, and deliberation: Advancing an O-S-R-O-R model of communication effects. *Communication Theory, 19*(1), 66-88.

Chou, W. Y. S., Hunt, Y. M., Beckjord, E. B., Moser, R. P., & Hesse, B. W. (2009). Social media use in the United States: Implications for health communication. *Journal of Medical Internet Research, 11*(4), e48.

Chuang, K. Y., & Yang, C. C. (2010). Helping you to help me: exploring supportive interaction in online health community. *Proceedings of the American Society for Information Science and Technology, 47*(1), 1-10.

Chuang, K. Y., & Yang, C. C. (2012a). Interaction patterns of nurturant support exchanged in online health social networking. *Journal of Medical Internet Research, 14*(3), e54.

Chuang, K. Y., & Yang, C. C. (2012b). A study of informational support exchanges in MedHelp alcoholism community. In S. J. Yang, A. M. Greenberg & M. Endsley (Eds.), *Social computing, behavioral: Cultural modeling and prediction* (Vol. 7227, pp. 9-17): Springer Berlin Heidelberg.

Chung, J. E. (2013). Social interaction in online support groups: Preference for online social interaction over offline social interaction. *Computers in Human Behavior, 29*(4), 1408-1414.

Chung, T., Langenbucher, J., Labouvie, E., Pandina, R. J., & Moos, R. H. (2001). Changes in alcoholic patients' coping responses predict 12-month treatment outcomes. *Journal of Consulting and Clinical Psychology, 69*(1), 92-100.

Cobb, S. (1976). Social support as a moderator of life stress. *Psychosomatic Medicine, 38*, 300-314.

Cockle-Hearne, J., Charnay-Sonnek, F., Denis, L., Fairbanks, H. E., Kelly, D., Kav, S., . . . Jensen, B. T. (2013). The impact of supportive nursing care on the needs of men with prostate cancer: A study across seven European countries. *British Journal of Cancer, 109*(8), 2121-2130.

Cohen, J. , Cohen, P., West, S. G. , & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Hillsdale, HJ: Lawrence Erlbaum Associates.

Cohen, S. (1988). Psychosocial models of the role of social support in the etiology of physical disease. *Health Psychology, 7*(3), 269-297.

Cohen, S., Gottlieb, B. H., & Underwood, L. G. (2000). Social relationships and health. In S. Cohen, L. G. Underwood & B. H. Gottlieb (Eds.), *Social support measurement and intervention* (pp. 3-25). New York, NY: Oxford University Press.

Cohen, S., & Hoberman, H. M. (1983). Positive events and social supports as buffers of life change stress. *Journal of Applied Social Psychology, 13*(2), 99-125.

Cohen, S., & McKay, G. (1984). Social support, stress, and the buffering hypothesis: A theoretical analysis. *Handbook of Psychology and Health, 4*, 253-267.

Cohen, S., Sherrod, D. R., & Clark, M. S. (1986). Social skills and the stress-protective role of social support. *Journal of Personality and Social Psychology, 50*(5), 963-973.

Cohen, S., & Syme, S. L. (1985). Issues in the study and application of social support. In S. Cohen & S. L. Syme (Eds.), *Social support and health* (pp. 3-22). New York, NY: Academic

Cohen, S., Underwood, L. G., & Gottlieb, B. H. (2000). *Social support measurement and intervention*. New York, NY: Oxford University Press.

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*(2), 310-357.

Cohn, A. M., Hunter-Reel, D., Hagman, B. T., & Mitchell, J. (2011). Promoting behavior change from alcohol use through mobile technology: The future of ecological momentary assessment. *Alcoholism: Clinical and Experimental Research, 35*(12), 2209-2215.

Conger, J. J. (1956). Alcoholism: Theory, problem, and challenges. II. Reinforcement theory and the dynamics of alcoholism *Quarterly Journal of Studies on Alcohol, 13*, 296-305.

Conway, L. G., Ryder, A. G., Tweed, R. G., & Sokol, B. W. (2001). Intranational cultural variation: Exploring further implications of collectivism within the United States. *Journal of Cross-Cultural Psychology, 32*(6), 681-697.

Cooney, N. L., Litt, M. D., Morse, P. A., Bauer, L. O., & Gaupp, L. (1997). Alcohol cue reactivity, negative-mood reactivity, and relapse in treated alcoholic men. *Journal of Abnormal Psychology, 106*(2), 243-250.

Cooper, M. L., Russell, M., & George, W. H. (1988). Coping, expectancies, and alcohol abuse: A test of social learning formulations. *Journal of Abnormal Psychology, 97*(2), 218-230.

Coulson, N. S. (2005). Receiving social support online: An analysis of a computer-mediated support group for individuals living with irritable bowel syndrome. *CyberPsychology & Behavior, 8*(6), 580-584.

Coulson, N. S. (2014). Sharing, supporting and sobriety: A qualitative analysis of messages posted to alcohol-related online discussion forums in the United Kingdom. *Journal of Substance Use, 19*, 176-180.

Coulson, N. S., Buchanan, H., & Aubeeluck, A. (2007). Social support in cyberspace: A content analysis of communication within a Huntington's disease online support group. *Patient Education and Counseling, 68*(2), 173-178.

Coulson, N. S., & Kniff, R. C. (2007). Coping with food allergy: Exploring the role of the online support group. *CyberPsychology and Behavior, 10*(1), 145-148.

Coursaris, C. K., & Liu, M. (2009). An analysis of social support exchanges in online HIV/AIDS self-help groups. *Computers in Human Behavior, 25*(4), 911-918.

Creamer, M., Burgess, P., & Pattison, P. (1992). Reaction to trauma: A cognitive processing model. *Journal of Abnormal Psychology, 101*(3), 452-459.

Culnan, M., & Markus, M. L. (1987). Information technologies In F. M. Jablin, L. L. Putnam, K. H. Robert & L. W. Porter (Eds.), *Handbook of organizational communication: An interdisciplinary perspective* (pp. 420-444). Newbury Park, CA: Sage.

Cunningham, J. A. (2012). Comparison of two internet-based interventions for problem drinkers: Randomized controlled trial. *Journal of Medical Internet Research, 14*(4), e107.

Cunningham, J. A., van Mierlo, T., & Fournier, R. (2008). An online support group for problem drinkers: AlcoholHelpCenter.net. *Patient Education and Counseling, 70*(2), 193-198.

Curran, G. M., Kirchner, J. E., Worley, M., Rookey, C., & Booth, B. M. (2002). Depressive symptomatology and early attrition from intensive outpatient substance use treatment. *Journal of Behavioral Health Services & Research, 29*(2), 138-143.

Cutrona, C. E., & Russell, D. W. . (1990). Social support: An interactional behaviors. In B. R. Sarason, I. G. Sarason & G. R. Pierce (Eds.), *Types of social support and specific stress: Toward a theory of optimal matching* (pp. 319-366). New York, NY: Wiley.

Cutrona, C. E., & Suhr, J. A. (1994). Social support communication in the context of marriage: An analysis of couples' supportive interactions. In B. R. Burleson, T. L. Albrecht & I. G. Sarason (Eds.), *The communication of social support: Messages, interactions, relationships, and community* (pp. 113-135). Newbury, CA: Sage.

Daeppen, J. B., Smith, T. L., Danko, G. P., Gordon, L., Landi, N. A., Nurnberger, J. I., . . . Schuckit, M. A. (2000). Clinical correlates of cigarette smoking and nicotine dependence in alcohol-dependent men and women. *Alcohol and Alcoholism, 35*(2), 171-175.

Daft, R. L., & Lengel, R. H. (1984). Information richness: A new approach to managerial behavior and organization design. In B. M. Staw & L. L. Cummings (Eds.), *Research in organizational behavior* (Vol. 6, pp. 191-233). Greenwich, CT: JAI Press.

Daft, R. L., & Lengel, R. H. (1986). Organizational information requirements, media richness and structural design. *Management Science, 32*(5), 554-571.

Daft, R. L., Lengel, R. H., & Trevino, L. K. (1987). Message equivocality, media selection, and manager performance: Implications for information systems. *MIS Quarterly, 11*, 355-368.

David, J. P., & Suls, J. (1999). Coping efforts in daily life: Role of big five traits and problem appraisals. *Journal of Personality, 67*(2), 265-294.

Davison, K. P., Pennebaker, J. W., & Dickerson, S. S. (2000). Who talks? The social psychology of illness support groups. *American Psychologist, 55*(2), 205-217.

Dawson, D. A. (2000). Drinking as a risk factor for sustained smoking. *Drug and Alcohol Dependence, 59*(3), 235-249.

Dawson, D. A., Grant, B. F., Stinson, F. S., & Chou, P. S. (2006). Estimating the effect of help-seeking on achieving recovery from alcohol dependence. *Addiction, 101*(6), 824-834.

Deans, G., Bennett-Emslie, G. B., Weir, J., Smith, D. C., & Kaye, S. B. (1988). Cancer support groups--who joins and why? *British Journal of Cancer, 58*(5), 670-674.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227-268.

DePaulo, B. M., & Fisher, J. D. (1980). The costs of asking for help. *Basic and Applied Social Psychology, 1*(1), 23-35.

Dobkin, P. L., Civita, M. D., Paraherakis, A., & Gill, K. (2002). The role of functional social support in treatment retention and outcomes among outpatient adult substance abusers. *Addiction, 97*(3), 347-356.

Dolan, S. L., Rohsenow, D. J., Martin, R. A., & Monti, P. M. (2013). Urge-specific and lifestyle coping strategies of alcoholics: Relationships of specific strategies to treatment outcome. *Drug and Alcohol Dependence, 128*(1), 8-14.

Doumas, D. M., Blasey, C. M., & Thacker, C. L. (2005). Attrition from alcohol and drug outpatient treatment: Psychological distress and interpersonal problems as indicators. *Alcoholism Treatment Quarterly, 23*(4), 55-67.

Drake, R. E., & Brunette, M. F. (1998). Complications of severe mental illness related to alcohol and drug use disorders. *Recent Developments in Alcoholism, 14*, 285-299.

Drossman, D. A., Leserman, J., Li, Z., Keefe, F., Hu, Y. J. B., & Toomey, T. C. (2000). Effects of coping on health outcome among women with gastrointestinal disorders. *Psychosomatic Medicine, 62*(3), 309-317.

DuBenske, L. L., Gustafson, D. H., Shaw, B. R., & Cleary, J. F. (2010). Web-based cancer communication and decision making systems: Connecting patients, caregivers, and clinicians for improved health outcomes. *Medical Decision Making, 30*(6), 732-744.

Duggan, M., & Smith, A. (2013). Cell Internet use 2013. Retrieved from http://pewinternet.org/~/media//Files/Reports/2013/PIP_CellInternetUse2013.pdf

Dunkel-Schetter, C., & Bennett, T. L. (1990). Differentiating the cognitive and behavioral aspects of social support. In B. R. Sarason, I. G. Sarason & G. R. Pierce (Eds.), *Social support: An interactional view* (pp. 267-296). New York, NY: Wiley.

Dunkel-Schetter, C. (1984). Social support and cancer: Findings based on patient interviews and their implications. *Journal of Social Issues, 40*(4), 77-98.

DuPont, R. L., & McGovern, J. P. (1994). *A bridge to recovery: An introduction to 12-step programs*. Washington, DC: American Psychiatric Press.

Dutta, M. J., & Feng, H. (2007). Health orientation and disease state as predictors of online health support group use. *Health Communication, 22*(2), 181-189.

Eagly, A. H., & Crowley, M. (1986). Gender and helping behavior: A meta-analytic review of the social psychological literature. *Psychological Bulletin, 100*(3), 283-308.

Eichhorn, K. C. (2008). Soliciting and providing social support over the Internet: An investigation of online eating disorder support groups. *Journal of Computer-Mediated Communication, 14*(1), 67-78.

Eveland, W. P. Jr. (2001). The cognitive mediation model of learning from the news evidence from nonelection, off-year election, and presidential election contexts. *Communication Research, 28*(5), 571-601.

Eveland, W. P. Jr. (2004). The effect of political discussion in producing informed citizens: The roles of information, motivation, and elaboration. *Political Communication, 21*(2), 177-193.

Fals-Stewart, W., & Lucente, S. (1994). Effect of neurocognitive status and personality functioning on length of stay in residential substance abuse treatment: An integrative study. *Psychology of Addictive Behaviors, 8*(3), 179-190.

Ferguson, J. A., Patten, C. A., Schroeder, D. R., Offord, K. P., Eberman, K. M., & Hurt, R. D. (2003). Predictors of 6-month tobacco abstinence among 1224 cigarette smokers treated for nicotine dependence. *Addictive Behaviors, 28*(7), 1203-1218.

Feshbach, N. D. (1982). Sex differences in empathy and social behavior in children. In N. Eisenberg (Ed.), *The development of prosocial behavior* (pp. 315-338). New York, NY: Academic Press.

Finfgeld-Connett, D. (2009). Web-based treatment for rural women with alcohol problems: Preliminary findings. *Computers Informatics Nursing, 27*(6), 345-353.

Finfgeld, D. L. (2000). Therapeutic groups online: the good, the bad, and the unknown. *Issues in Mental Health Nursing, 21*(3), 241-255.

Finn, J. (1999). An exploration of helping processes in an online self-help group focusing on issues of disability. *Health & Social Work, 24*(3), 220-231.

Fishbein, M., & Cappella, J. N. (2006). The role of theory in developing effective health communications. *Journal of Communication, 56*(S1), S1-S17.

Folkman, S., & Lazarus, R. S. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behavior, 21*, 219-239.

Foster, T. (2001). Dying for a drink: Global suicide prevention should focus more on alcohol use disorders. *BMJ: British Medical Journal, 323*(7317), 817-818.

Fukuoka, Y., Kamitani, E., Bonnet, K., & Lindgren, T. (2011). Real-time social support through a mobile virtual community to improve healthy behavior in overweight and sedentary adults: A focus group analysis. *Journal of Medical Internet Research, 13*(3), e49.

Gerend, M.A, & Maner, J.K. (2011). Fear, anger, fruits, and veggies: Interactive effects of emotion and message framing on health behavior. *Health Psychology, 30*(4), 420-423.

Gilligan, C. . (1982). *In a different voice: Psychological theory and women's development* Cambridge, MA: Harvard University Press.

Gleason, M. E. J., Iida, M., Bolger, N., & Shrout, P. E. (2003). Daily supportive equity in close relationships. *Personality and Social Psychology Bulletin, 29*(8), 1036-1045.

Gogineni, A., Stein, M. D., & Friedmann, P. D. (2001). Social relationships and intravenous drug use among methadone maintenance patients. *Drug and Alcohol Dependence, 64*(1), 47-53.

Goldsmith, D. J. (2004). *Commuicating social support*. New York, NY: Cambridge University Press.

Goldsmith, D. J., & Fitch, K. (1997). The normative context of advice as social support. *Human Communication Research, 23*(4), 454-476.

Gottlieb, B. H. (2000). Selecting and planning support intervention In S. Cohen, L. G. Underwood & B. H. Gottlieb (Eds.), *Social support measurement and intervention: A guide for health and social scientists* (pp. 195-220). New York, NY: Oxford University Press.

Gottlieb, B. H., & Bergen, A. E. (2010). Social support concepts and measures. *Journal of Psychosomatic Research, 69*(5), 511-520.

Granovetter, M. S. (1973). The strength of weak ties. *American Journal of Sociology, 78*(6), 1360-1380.

Granovetter, M. S. (1982). The strength of weak ties: A network theory revisited. In P. V. Marsden & N. Lin (Eds.), *Social structure and network analysis* (pp. 105-130). Newbury Park, CA: Sage.

Green-Hamann, S., Campbell Eichhorn, K., & Sherblom, J. C. (2011). An exploration of why people participate in Second Life social support groups. *Journal of Computer-Mediated Communication, 16*(4), 465-491.

Green, M. C. (2006). Narratives and cancer communication. *Journal of Communication, 56*(S1), S163-S183.

Greene, J. A., Choudhry, N. K., Kilabuk, E., & Shrank, W. H. (2011). Online social networking by patients with diabetes: A qualitative evaluation of communication with Facebook. *Journal of General Internal Medicine, 26*(3), 287-292.

Groh, D. R., Jason, L. A., Davis, M. I., Olson, B. D., & Ferrari, J. R. (2007). Friends, family, and alcohol abuse: An examination of general and alcohol-specific social support. *The American Journal on Addictions, 16*(1), 49-55.

Gunthert, K. C., Cohen, L. H., & Armeli, S. (1999). The role of neuroticism in daily stress and coping. *Journal of Personality and Social Psychology,* 77(5), 1087-1100.

Gustafson, D. H., Boyle, M. G., Shaw, B. R., Isham, A. J., McTavish, F. M., Richards, S., . . . Johnson, K. (2011). An e-health solution for people with alcohol problems. *Alcohol Research & Health, 33*(4), 327-337.

Gustafson, D. H., Hawkins, R. P., Boberg, E. W., McTavish, F. M., Owens, B., Wise, M. E., . . . Pingree, S. . (2002). CHESS: 10 years of research and development in consumer health informatics for broad populations, including the underserved. *International Journal of Medical Informatics, 65*(3), 169-177.

Gustafson, D. H., Hawkins, R. P., Boberg, E. W., Pingree, S., Serlin, R. E., Graziano, F., & Chan, C. L. (1999). Impact of a patient-centered, computer-based health information/support system. *American Journal of Preventive Medicine, 16*(1), 1-9.

Gustafson, D. H., Hawkins, R. P., McTavish, F. M., Pingree, S., Chen, W. C., Volrathongchai, K., . . . Serlin, R. C. (2008). Internet-based interactive support for cancer patients: Are integrated systems better? *Journal of Communication, 58*(2), 238-257.

Gustafson, D. H., Hawkins, R. P., Pingree, S., McTavish, F. M., Arora, N. K., Mendenhall, J., . . . Stewart, J. (2001). Effect of computer support on younger women with breast cancer. *Journal of General Internal Medicine, 16*(7), 435-445.

Gustafson, D. H., McTavish, F. M., Atwood, A. K., Chih, M.-Y., Shah, D. V., Boyle, M. G, & Levy, M. (2012). *Effects of a mHealth intervention for alcohol relpase prevention: A randomized trial*. Paper presented at the 2012 mHealth Summit Washington, DC.

Gustafson, D. H., McTavish, F. M., Chih, M.-Y., Atwood, A. K., Johnson, R. A., Boyle, M. G., . . . Shah, D. V. (2014). Smartphone app helps support recovery after treatment for alcoholism. *JAMA Psychiatry*.

Gustafson, D. H., Shaw, B. R., Isham, A. J., Baker, T. B., Boyle, M. G., & Levy, M. S. (2011). Explicating an evidence-based, theoretically informed, mobile technology-based system to improve outcomes for people in recovery for alcohol dependence. *Substance Use & Misuse, 46*(1), 96-111.

Hagerty, B. M., & Williams, R. A. (1999). The effects of sense of belonging, social support, conflict, and loneliness on depression. *Nursing Research, 48*(4), 215-219.

Hagerty, B. M., Williams, R. A., Coyne, J. C., & Early, M. R. (1996). Sense of belonging and indicators of social and psychological functioning. *Archives of Psychiatric Nursing, 10*(4), 235-244.

Hagger, M. S., & Orbell, S. (2003). A meta-analytic review of the common-sense model of illness representations. *Psychology and Health, 18*(2), 141-184.

Hammer, M. (1983). 'Core' and 'extended' social networks in relation to health and illness. *Social Science & Medicine, 17*(7), 405-411.

Han, J. Y., Kim, J., Yoon, H. J., Shim, M., McTavish, F. M., & Gustafson, D. H. (2012). Social and psychological determinants of levels of engagement with an online breast cancer support group: Posters, lurkers, and nonusers. *Journal of Health Communication, 17*(3), 356-371.

Han, J. Y., Shah, D. V., Kim, E., Namkoong, K., Lee, S. Y., Moon, T. J., . . . Gustafson, D. H. (2011). Empathic exchanges in online cancer support groups: Distinguishing message expression and reception effects. *Health Communication, 26*(2), 185-197.

Han, J. Y., Shaw, B. R., Hawkins, R. P., Pingree, S., McTavish, F. M., & Gustafson, D. H. . (2008). Expressing positive emotions within online support groups by women with breast cancer *Journal of Health Psychology, 13*(8), 1002-1007.

Han, J. Y., Wise, M. E., Kim, E., Pingree, R. J., Hawkins, R. P., Pingree, S., . . . Gustafson, D. H. (2010). Factors associated with use of interactive cancer communication system: An application of the comprehensive model of information seeking. *Journal of Computer-Mediated Communication, 15*(3), 367-388.

Hancock, J. T., & Dunham, P. J. (2001). Impression formation in computer-mediated communication revisited: An analysis of the breadth and intensity of impressions. *Communication Research, 28*(3), 325-347.

Harris, S. M., Dersch, C. A., & Mittal, M. (1999). Look who's talking: Measuring self-disclosure in MFT. *Contemporary Family Therapy, 21*(3), 405-415.

Harrison, J., Maguire, P., & Pitceathly, C. (1995). Confiding in crisis: Gender differences in pattern of confiding among cancer patients. *Social Science & Medicine, 41*(9), 1255-1260.

Havassy, B. E., Hall, S. M., & Wasserman, D. A. (1991). Social support and relapse: Commonalities among alcoholics, opiate users, and cigarette smokers. *Addictive Behaviors, 16*(5), 235-246.

Havassy, B. E., Wasserman, D. A., & Hall, S. M. (1995). Social relationships and abstinence from cocaine in an American treatment sample. *Addiction, 90*(5), 699-710.

Hayes, A. F., & Krippendorff, K. (2007). Answering the call for a standard reliability measure for coding data. *Communication Methods and Measures, 1*(1), 77-89.

Hays, J. C., Saunders, W. B., Flint, E. P., Kaplan, B. H., & Blazer, D. G. (1997). Social support and depression as risk factors for loss of physical function in late life. *Aging & Mental Health, 1*(3), 209-220.

Heijmans, M. (1998). Coping and adaptive outcome in chronic fatigue syndrome: Importance of illness cognitions. *Journal of Psychosomatic Research, 45*(1), 39-51.

Helgeson, V. S., & Cohen, S. (1996). Social support and adjustment to cancer: Reconciling descriptive, correlational, and intervention research. *Health Psychology, 15*(2), 135-148.

Helgeson, V. S., & Gottlieb, B. H. (2000). Support groups. In S. Cohen, L. G. Underwood & B. H. Gottlieb (Eds.), *Social support measurement and intervention: A guide for health and social scientists* (pp. 221-245). New York, NY: Oxford University Press.

Henderson, S. (1981). Social relationships, adversity and neurosis: An analysis of prospective observations. *The British Journal of Psychiatry, 138*(5), 391-398.

Herring, S. C. (2002). Computer-mediated communication on the Internet. *Annual Review of Information Science and Technology, 36*, 109-168.

Hiemstra, G. (1982). Teleconferencing, concern for face, and organizational culture. In M. Burgoon (Ed.), Communication yearbook 6 (pp. 874-904). Beverly Hills, CA: Sage.

Hiltz, S. R., Johnson, K., & Turoff, M. (1986). Experiments in group decision making: Communication process and outcome in face-to-face versus computerized conferences. *Human Communication Research, 13*(2), 225-252.

Hodgins, D. C., El-Guebaly, N., & Armstrong, S. (1995). Prospective and retrospective reports of mood states before relapse to substance use. *Journal of Consulting and Clinical Psychology, 63*(3), 400-407.

Hoffman, M. L. (1977). Sex differences in empathy and related behaviors. *Psychological Bulletin, 84*(4), 712-722.

Holahan, C. J., Moos, R. H., & Bonin, L. (1997). Social support, coping, and psychological adjustment: A resource model. In H. R. Pierce, B. Lakey, I. G. Sarason & B. R. sarason (Eds.), *Soucebook of social support and personality*. New York, NY: Plenum.

Holahan, C. J., Moos, R. H., Holahan, C. K., & Brennan, P. L. (1995). Social support, coping, and depressive symptoms in a late-middle-aged sample of patients reporting cardiac illness. *Health Psychology, 14*(2), 152-163.

Holahan, C. J., Moos, R. H., Holahan, C. K., Cronkite, R. C., & Randall, P. K. (2003). Drinking to cope and alcohol use and abuse in unipolar depression: A 10-year model. *Journal of Abnormal Psychology, 112*(1), 159-165.

Holland, K. D., & Holahan, C. K. (2003). The relation of social support and coping to positive adaptation to breast cancer. *Psychology and Health, 18*(1), 15-29.

House, J. S. (1981). *Work stress and social support*. Reading, MA: Addison-Wesley.

House, J. S., & Kahn, R. L. (1985). Measures and concepts of social support. In S. Cohen & S. L. Syme (Eds.), *Social support and health* (pp. 83-108). Orlando, FL: Academic Press.

House, J. S., Umberson, D., & Landis, K. R. (1988). Structures and processes of social support. *Annual Review of Sociology, 14*(1), 293-318.

Hovland, C. I., Jains, I. L., & Kelley, H. H. (1953). *Communication and persuasion: Psychological studies of opinion and change*. New Haven, CT: Yale University Press.

Humphreys, K., Mankowski, E. S., Moos, R. H., & Finney, J. W. (1999). Do enhanced friendship networks and active coping mediate the effect of self-help groups on substance abuse? *Annals of Behavioral Medicine, 21*(1), 54-60.

Humphreys, K., Moos, R. H., & Finney, J. W. (1995). Two pathways out of drinking problems without professional treatment. *Addictive Behaviors, 20*(4), 427-441.

Isham, A., Shaw, B. R., & Gustafson, D. H. (2013). Developing and testing mobile health applications to affect behavior change: Lessons from the field. In D. K. Kim, A. Singhal & G. L. Kreps (Eds.), *Health communication: Strategies for developing global health programs* (Vol. 5, pp. 37-50). New York, NY: Peter Lang.

Istepanian, R. S. H., Jovanov, E., & Zhang, Y. T. (2004). Guest editorial introduction to the special section on m-health: Beyond seamless mobility and global wireless health-care connectivity. *IEEE Transactions on Information Technology in Biomedicine, 8*(4), 405-414.

Jamison, R. (2014, May 1). New smart phone apps help doctors manage pain patients, *ScienceDaily*. Retrieved from www.sciencedaily.com/releases/2014/05/140501211459.htm

Junglas, I. A., & Watson, R. T. (2003). U-commerce: A conceptual extension of e- and m-commerce. Paper presented at the International Conference on Information Systems, Seattle, WA.

Jiang, L. C., Bazarova, N. N., & Hancock, J. T. (2013). From perception to behavior disclosure reciprocity and the intensification of intimacy in computer-mediated communication. *Communication Research, 40*(1), 125-143.

Johnson, D. J. (1997). *Cancer-related information seeking*. Cresskill, NJ: Hampton Press.

Johnson, F. L., & Aries, E. J. (1983). Conversational patterns among same-sex pairs of late-adolescent close friends. *Journal of Genetic Psychology, 142*(2), 225-238.

Johnson, K. A., & Jennison, K. M. (1994). Stressful loss and the buffering effect of social support on drinking behavior among African-Americans: Results of a national survey. *Journal of Alcohol and Drug Education, 39*, 1-24.

Johnson, K., Isham, A. Shah, D. V., & Gustafson, D. H. (2011). Potential roles for new communication technologies in treatment of addiction. *Current Psychiatry Reports, 13*(5), 390-397.

Johnson, T. (2007). Review of WordStat 5.1, SIMSTAT 2.5, and QDA Miner 2.0. *Political Methodologist, 15*(1), 11-14.

Joinson, A. N. (2001). Self-disclosure in computer-mediated communication: The role of self-awareness and visual anonymity. *European Journal of Social Psychology, 31*(2), 177-192.

Kahn, R. L., & Antonucci, T. C. (1980). Convoys over the life course: Attachment, roles and social support. In P. B. Baltes & O. Brim (Eds.), *Life span development and behavior* (pp. 253-286). New York, NY: Academic Press.

Kalyanaraman, S., & Sundar, S. S. (2006). The psychological appeal of personalized content in web portals: Does customization affect attitudes and behavior? *Journal of Communication, 56*(1), 110-132.

Kanayama, T. (2003). Ethnographic research on the experience of Japanese elderly people online. *New Media & Society, 5*(2), 267-288.

Keith-Lucas, A. (1994). *Giving and taking help* (2nd ed.). St. Davids, PA: North American Association of Christian Social Workers.

Kelly, A. E., & Achter, J. A. (1995). Self-concealment and attitudes toward counseling in university students. *Journal of Counseling Psychology, 42*(1), 40-46.

Kemmelmeier, M., Jambor, E. E., & Letner, J. (2006). Individualism and good works: Cultural variation in giving and volunteering across the United States. *Journal of Cross-Cultural Psychology, 37*(3), 327-344.

Khadjesari, Z., Murray, E., Hewitt, C., Hartley, S., & Godfrey, C. (2011). Can stand-alone computer-based interventions reduce alcohol consumption? A systematic review. *Addiction, 106*(2), 267-282.

Khantzian, E. J. (1985). The self-medication hypothesis of addictive disorders: Focus on heroin and cocaine dependence. *American Journal of Psychiatry, 142*(11), 1259-1264.

Kim, E., Han, J. Y., Moon, T. J., Shaw, B. R., Shah, D. V., McTavish, F. M., & Gustafson, D. H. (2012). The process and effect of supportive message expression and reception in online breast cancer support groups. *Psycho-Oncology, 21*(5), 531-540.

Kim, E., Han, J. Y., Shah, D. V., Shaw, B. R., McTavish, F. M, Gustafson, D. H., & Fan, D. P. (2011). Predictors of supportive message expression and reception in an interactive cancer communication system. *Journal of Health Communication, 16*(10), 1106-1121.

Kim, J., Han, J. Y., Shaw, B. R., McTavish, F. M., & Gustafson, D. H. (2010). The roles of social support and coping strategies in predicting breast cancer patients' emotional well-being: Testing mediation and moderation models. *Journal of Health Psychology, 15*(4), 543-552.

Klemm, P., Hurst, M., Dearholt, S. L., & Trone, S. R. (1999). Gender differences on Internet cancer support groups. *Computers in Nursing, 17*(2), 65-72.

Komiya, N., Good, G. E., & Sherrod, N. B. (2000). Emotional openness as a predictor of college students' attitudes toward seeking psychological help. *Journal of Counseling Psychology, 47*(1), 138-143.

Koutsopoulou, S., Papathanassoglou, E. D. E., Katapodi, M. C., & Patiraki, E. I. (2010). A critical review of the evidence for nurses as information providers to cancer patients. *Journal of Clinical Nursing, 19*, 749-765.

Krause, N. (1986). Social support, stress, and well-being among older adults. *Journal of Gerontology, 41*(4), 512-519.

Krause, N., Herzog, A. R., & Baker, E. (1992). Providing support to others and well-being in later life. *Journal of Gerontology, 47*(5), 300-311.

Krause, N., & Shaw, B. A. (2000). Giving social support to others, socioeconomic status, and changes in self-esteem in late life. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 55*(6), 323-333.

Kreuter, M. W., Farrell, D., Olevitch, L., & Brennan, L. (2000). *Tailoring health messages: Customizing communication with computer technology*. Manwah, NJ: Lawrence Erlbaum Associates

Kreuter, M. W., Green, M. C., Cappella, J. N., Slater, M. D., Wise, M. E., Storey, D., . . . Woolley, S. (2007). Narrative communication in cancer prevention and control: A framework to guide research and application. *Annals of Behavioral Medicine, 33*(3), 221-235.

Kristiansen, M., Tjørnhøj-Thomsen, T., & Krasnik, A. (2010). The benefit of meeting a stranger: Experiences with emotional support provided by nurses among Danish-born and migrant cancer patients. *European Journal of Oncology Nursing, 14*(3), 244-252.

Krizek, C., Roberts, C., Ragan, R., Ferrara, J. J., & Lord, B. (1999). Gender and cancer support group participation. *Cancer Practice, 7*(2), 86-92.

Kushner, M. G., Abrams, K., & Borchardt, C. (2000). The relationship between anxiety disorders and alcohol use disorders: A review of major perspectives and findings. *Clinical Psychology Review, 20*(2), 149-171.

Lazarus, R. S. (1993). Coping theory and research: Past, present, and future. *Psychosomatic Medicine, 55*(3), 234-247.

Lea, M., & Spears, R. (1992). Paralanguage and social perception in computer-mediated communication. *Journal of Organizational Computing 2*(3-4), 321-341.

Leatham, G., & Duck, S. (1990). Conversations with friends and the dynamics of social support. In S. Duck & R. C. Silver (Eds.), *Personal relationships and social support* (pp. 1-29). London, UK: Sage.

Lepore, S. J. (2001). A social–cognitive processing model of emotional adjustment to cancer. In A. Baum & B. L. Andersen (Eds.), *Psychosocial interventions for cancer* (pp. 99-116). Washington, DC: American Psychological Association

Lieberman, M. A., & Goldstein, B. A. (2005). Self-help on-line: An outcome evaluation of breast cancer bulletin boards. *Journal of Health Psychology, 10*(6), 855-862.

Lieberman, M. A., & Goldstein, B. A. (2006). Not all negative emotions are equal: The role of emotional expression in online support groups for women with breast cancer. *Psycho-Oncology, 15*(2), 160-168.

Liebler, C. A., & Sandefur, G. D. (2002). Gender differences in the exchange of social support with friends, neighbors, and co-workers at midlife. *Social Science Research, 31*, 364-391.

Litman, G. K. (1986). Alcoholism survival: The prevention of relapse. In W. R. Miller & N. Heather (Eds.), *Treating Addictive Behaviors* (pp. 391-405). New York, NY: Plenum Press.

Litman, G. K., Eiser, J. R., Rawson, N. S. B., & Oppenheim, A. N. (1979). Differences in relapse precipitants and coping behaviour between alcohol relapsers and survivors. *Behaviour Research and Therapy, 17*(2), 89-94.

Litman, G. K., Stapleton, J., Oppenheim, A. N., & Peleg, M. (1983). An instrument for measuring coping behaviours in hospitalized alcoholics: Implications for relapse prevention treatment. *British Journal of Addiction, 78*(3), 269-276.

Litman, G. K., Stapleton, J., Oppenheim, A. N., Peleg, M., & Jackson, P. (1984). The relationship between coping behaviours, their effectiveness and alcoholism relapse and survival. *British Journal of Addiction, 79*(4), 283-291.

Loane, S. S., & D'Alessandro, S. (2013). Communication that changes lives: Social support within an online health community for ALS. *Communication Quarterly, 61*(2), 236-251.

Longabaugh, R., Beattie, M. C., Noel, N. E., Stout, R. L., & Malloy, P. . (1993). The effect of social investment on treatment outcome. *Journal of Studies on Alcohol and Drugs, 54*(4), 465-478.

Luszczynska, A., Mohamed, N. E., & Schwarzer, R. (2005). Self-efficacy and social support predict benefit finding 12 months after cancer surgery: The mediating role of coping strategies. *Psychology, Health & Medicine, 10*(4), 365-375.

Luszczynska, A., Pawlowska, I., Cieslak, R., Knoll, N., & Scholz, U. (2013). Social support and quality of life among lung cancer patients: A systematic review. *Psycho-Oncology, 22*(10), 2160-2168.

Luszczynska, A., Sarkar, Y., & Knoll, N. (2007). Received social support, self-efficacy, and finding benefits in disease as predictors of physical functioning and adherence to antiretroviral therapy. *Patient Education and Counseling, 66*(1), 37-42.

Macdonald, J. G. (1987). Predictors of treatment outcome for alcoholic women *The International Journal of the Addictions, 22*, 235-248.

Magura, S., Laudet, A. B., Mahmood, D., Rosenblum, A., Vogel, H. S., & Knight, E. L. (2003). Role of self-help processes in achieving abstinence among dually diagnosed persons. *Addictive Behaviors, 28*(3), 399-413.

Maisto, S. A., Connors, G. J., & Zywiak, W. H. (2000). Alcohol treatment changes in coping skills, self-efficacy, and levels of alcohol use and related problems 1 year following treatment initiation. *Psychology of Addictive Behaviors, 14*(3), 257-266.

Marlatt, G. A., & Gordon, J. R. (1985). *Relapse prevention: Maintenance strategies in the treatment of addictive behaviors*. New York, NY: Guilford Press.

Maxwell, S. E., & Cole, D. A. (2007). Bias in cross-sectional analyses of longitudinal mediation. *Psychological Methods, 12*(1), 23-44.

McClellan, W. M., Stanwyck, D. J., & Anson, C. A. (1993). Social support and subsequent mortality among patients with end-stage renal disease. *Journal of the American Society of Nephrology, 4*(4), 1028-1034.

McGuire, W. J. (1968). Personality and susceptibility to social influence. In E. F. Borgatta & W. W. Lambert (Eds.), *Handbook of personality theory and research* (pp. 1130-1187). Chicago, IL: Rand McNally.

McGuire, W. J. (1969). The nature of attitudes and attitude change. In G. Lindzey & E. Aronson (Eds.), *Handbook of social psychology* (Vol. 2nd, pp. 136-314). Reading, MA: Addison-Wesley.

McKay, J. R. (2005). Is there a case for extended interventions for alcohol and drug use disorders? *Addiction, 100*(11), 1594–1610.

McKenna, K. Y. A., & Bargh, J. A. (1998). Coming out in the age of the Internet: Identity "demarginalization" through virtual group participation. *Journal of Personality and Social Psychology, 75*(3), 681-694.

McLaughlin, M., Nam, Y., Gould, J., Pade, C., Meeske, K. A., Ruccione, K. S., & Fulk, J. (2012). A videosharing social networking intervention for young adult cancer survivors. *Computers in Human Behavior, 28*(2), 631-641.

McLellan, A. T., Carise, D., & Kleber, H. D. (2003). Can the national addiction treatment infrastructure support the public's demand for quality care. *Journal of Substance Abuse Treatment, 25*(2), 117-121.

McLellan, A. T., McKay, J. R., Forman, R., Cacciola, J., Kemp, J.. (2005). Reconsidering the evaluation of addiction treatment: From retrospective follow-up to concurrent recovery monitoring. *Addiction, 100*(4), 447–458.

McTavish, F. M., Chih, M.-Y., Shah, D. V., & Gustafson, D. H. (2012). How patients recovering from alcoholism use a smartphone intervention. *Journal of Dual Diagnosis, 8*(4), 294-304.

Measelle, J. R., Stice, E., & Springer, D. W. (2006). A prospective test of the negative affect model of substance abuse: Moderating effects of social support. *Psychology of Addictive Behaviors, 20*(3), 225-233.

Meier, A. (2004). Technology-mediated groups. In C. D. Garvin, L. M. Gutie'rrez & M. J. Galinsky (Eds.), *Handbook of social work with groups* (pp. 479-503). New York, NY: Guilford.

Mello, S., Tan, A. S. L., Armstrong, K., Sanford Schwartz, J., & Hornik, R. C. (2013). Anxiety and depression among cancer survivors: the role of engagement with sources of emotional support information. *Health Communication, 28*(4), 389-396.

Miller, W. R., Westerberg, V. S., Harris, R. J., & Tonigan, J. S. (1996). What predicts relapse? Prospective testing of antecedent models. *Addiction, 91*(12s1), 155-172.

Mo, P. K. H., & Coulson, N. S. (2008). Exploring the communication of social support within virtual communities: A content analysis of messages posted to an online HIV/AIDS support group. *CyberPsychology & Behavior, 11*(3), 371-374.

Mo, P. K. H., & Coulson, N. S. (2010). Empowering processes in online support groups among people living with HIV/AIDS: A comparative analysis of lurkers and posters. *Computers in Human Behavior, 26*(5), 1183-1193.

Moggi, F., Ouimette, P. C., Moos, R. H., & Finney, J. W. (1999). Dual diagnosis patients in substance abuse treatment: Relationship of general coping and substance-specific coping to 1-year outcomes. *Addiction, 94*(12), 1805-1816.

Monti, P. M., Kadden, R., Rohsenow, D. J., Cooney, N. L., & Abrams, D. B. (2002). *Treating alcohol dependence: A coping skills training guide* (2nd ed.). New York, NY: Guilford Press.

Monti, P. M., & Rohsenow, D. J. (2003). Coping skills training and cue exposure treatment In R. K. Hester & W. R. Miller (Eds.), *Handbook of alcoholism treatment approaches: Effective alternatives* (pp. 213-236). Boston, MA: Allyn & Bacon.

Monti, P. M., Rohsenow, D. J., Rubonis, A. V., Niaura, R. S., Sirota, A. D., Colby, S. M., . . . Abrams, D. B. (1993). Cue exposure with coping skills treatment for male alcoholics: A preliminary investigation. *Journal of Consulting and Clinical Psychology, 61*(6), 1011-1019.

Moos, R. H., & Moos, B. S. (2007). Protective resources and long-term recovery from alcohol use disorders. *Drug and Alcohol Dependence, 86*, 46-54.

Morris, E. P., Stewart, S. H., & Ham, L. S. (2005). The relationship between social anxiety disorder and alcohol use disorders: A critical review. *Clinical Psychology Review, 25*(6), 734-760.

Mowbray, C. T., Moxley, D. P., Thrasher, S., Bybee, D., & Harris, S. (1996). Consumers as community support providers: Issues created by role innovation. *Community Mental Health Journal, 32*, 47-67.

Muessig, K. E., Pike, E. C., Fowler, B., LeGrand, S., Parsons, J. T., Bull, S. S., . . . Hightow-Weidman, L. B. (2013). Putting prevention in their pockets: Developing mobile phone-based HIV interventions for black men who have sex with men. *AIDS Patient Care and STDs, 27*(4), 211-222.

Muthén, L. K., & Muthén, B. O. (2010). *Mplus user's guide v.6.1*. Los Angeles, LA: Muthén & Muthén

Nadler, A. (1997). Personality and help seeking. In G. R. Pierce, B. Lakey, I. G. Sarason & B. R. Sarason (Eds.), *Sourcebook of social support and personality* (pp. 397-407). New York, NY: Plenum Press.

Nambisan, P. (2011). Information seeking and social support in online health communities: Impact on patients' perceived empathy. *Journal of the American Medical Informatics Association, 18*, 298-304.

Namkoong, K., DuBenske, L. L., Shaw, B. R., Gustafson, D. H., Hawkins, R. P., Shah, D. V., . . . Cleary, J. F. (2012). Creating a bond between caregivers online: Effect on caregivers' coping strategies. *Journal of Health Communication, 17*(2), 125-140.

Namkoong, K., McLaughlin, B., Yoo, W., Hull, S., Shah, D. V., Kim, S. C., . . . Gustafson, D. H. (2014). The effects of expression: How providing emotional support online improves cancer patients coping strategies. *Journal of the National Cancer Institute Monogrpahs, 47*, 169-174.

Namkoong, K., Shah, D. V., Han, J. Y., Kim, S. C., Yoo, W., Fan, D. P., . . . Gustafson, D. H. (2010). Expression and reception of treatment information in breast cancer support groups: How health self-efficacy moderates effects on emotional well-being. *Patient Education and Counseling, 81S*, S41-S47.

Nekmat, E. (2012). Message expression effects in online social communication. *Journal of Broadcasting & Electronic Media, 56*(2), 203-224.

Nelson-Le Gall, S. (1985). Help-seeking behavior in learning In E. W. Gordon (Ed.), *Review of research in education* (Vol. 12, pp. 55-90). Washington, DC: American Educational Research Association.

Neuendorf, K. A. (2002). *The content analysis guidebook*. Thousand Oaks, CA: Sage.

Norregaard, J., Tonnesen, P., & Petersen, L. (1993). Predictors and reasons for relapse in smoking cessation with nicotine and placebo patches. *Preventive Medicine, 22*(2), 261-271.

Nurullah, A. S. (2012). Received and provided social support: A review of current evidence and future directions *American Journal of Health Studies, 27*(3), 173-188.

O'Brien, T. B., & DeLongis, A. (1996). The Interactional context of problem-, emotion-, and relationship-focused coping: The role of the big five personality factors. *Journal of Personality, 64*(4), 775-813.

O'Brien, T. B., & DeLongis, A. (1997). Coping with chronic stress: An interpersonal perspective In B. H. Gottlieb (Ed.), *Coping with chronic stress* (pp. 161-190). New York, NY: Plenum Publishing Corporation

Ogasawara, T. (2011). Nielsen: 44% of smartphone owners visit social network sites. Retrieved from http://socialtimes.com/nielsen-44-of-smartphone-owners-visit-social-network-sites_b81979

Ouimette, P., Humphreys, K., Moos, R. H., Finney, J. W., Cronkite, R., & Federman, B. (2001). Self-help group participation among substance use disorder patients with posttraumatic stress disorder. *Journal of Substance Abuse Treatment, 20*(1), 25–32.

Ouimette, P, Moos, R. H., & Finney, J. W. (2003). PTSD treatment and 5-year remission among patients with substance use and posttraumatic stress disorders. *Journal of Consulting and Clinical Psychology, 71*(2), 410–414.

Park, M. R., Adelman, M. B., & Albrecht, T. L. (1987). Beyond close relationships: Support in weak ties. In T. L. Albrecht & M. B. adelman (Eds.), *Communicating social support* (pp. 126-147). Newbury Park, CA: Sage.

Peirce, R. S., Frone, M. R., Russell, M., & Cooper, M. L. (1996). Financial stress, social support, and alcohol involvement: A longitudinal test of the buffering hypothesis in a general population survey. *Health Psychology, 15*(1), 38-47.

Pennebaker, J. W. (1989). Confession, inhibition, and disease. *Advances in Experimental Social Psychology 22*, 211-244.

Pennebaker, J. W. (1997a). *Opening up: The healing power of expressing emotions.* New York, NY: Guilford Press.

Pennebaker, J. W. (1997b). Writing about emotional experiences as a therapeutic process. *Psychological Science, 8*(3), 162-166.

Pennebaker, J. W., & Beall, S. K. (1986). Confronting a traumatic event: Toward an understanding of inhibition and disease. *Journal of Abnormal Psychology, 95*(3), 274-281.

Pennebaker, J. W., & Seagal, J. D. (1999). Forming a story: The health benefits of narrative. *Journal of Clinical Psychology, 55*(10), 1243-1254.

Petty, R. E., & Cacioppo, J. T. (1984). The effects of involvement on responses to argument quantity and quality: Central and peripheral routes to persuasion. *Journal of Personality and Social Psychology, 46*(1), 69-81.

Petty, R. E., & Cacioppo, J. T. (1986a). *Communication and persuasion: Central and peripheral routes to attitude change*. New York, NY: Springer-Verlag.

Petty, R. E., & Cacioppo, J. T. (1986b). The elaboration likelihood model of persuasion. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 19, pp. 123-205). New York, NY: Academic Press.

Petty, R. E., Cacioppo, J. T., & Goldman, R. (1981). Personal involvement as a determinant of argument-based persuasion. *Journal of Personality and Social Psychology, 41*, 847-855.

Pierce, G. R., Sarason, B. R., Sarason, I. G., Joseph, H. J., & Henderson, C. A. (1996). Conceptualizing and assessing social support in the context of the family In G. R. Pierce, B. R. Sarason & I. G. Sarason (Eds.), *Handbook of social support and the family* (pp. 3-24). New York, NY: Plenum Press.

Piliavin, J. A., & Unger, R. K. (1985). The helpful but helpless female: Myth or reality? . In V. E. O'Leary, R. K. Unger & B. S. Wallston (Eds.), *Women, gender, and social psychology* (pp. 149-189). Hillsdale, NJ: Erlbaum.

Pingree, R. J. (2007). How messages affect their senders: A more general model of message effects and implications for deliberation. *Communication Theory, 17*(4), 439-461.

Pollach, I. (2010). Software review: WordStat 5.0. *Organizational Research Methods, 14*, 741-744.

Pyke, K. D., & Bengtson, V. L. (1996). Caring more or less: Individualistic and collectivist systems of family eldercare. *Journal of Marriage and the Family, 58*, 379-392.

Quanbeck, A. R., Gustafson, D. H., Marsch, L. A., McTavish, F. M., Brown, R. T., Mares, M,-L., Johnson, R., Glass, J. E., Atwood, A, K., & McDowell, H. (2014), Integrating addiction treatment into primary care using mobile health technolgy: Protocol for an implementation research study. *Implementation Science, 9*, 65.

Rains, S. A., & Young, V. (2009). A meta-analysis of research on formal computer-mediated support groups: Examining group characteristics and health outcomes. *Human Communication Research, 35*(3), 309-336.

Raupach, J. C. A., & Hiller, J. E. (2002). Information and support for women following the primary treatment of breast cancer. *Health Expectations, 5*(4), 289-301.

Ray, G. T., Mertens, J. R., & Weisner, C. (2007). The excess medical cost and health problems of family members of persons diagnosed with alcohol or drug problems. *Medical Care, 45*(2), 116-122.

Reevy, G. M., & Maslach, C. (2001). Use of social support: Gender and personality differences. *Sex Roles, 44*, 437-459

Richter, C., Effenberger, S., Bschor, T., Bonnet, U., Haasen, C., Preuss, U. W., . . . Glauner, T. (2012). Efficacy and safety of levetiracetam for the prevention of alcohol relapse in recently detoxified alcohol-dependent patients: A randomized trial. *Journal of Clinical Psychopharmacology, 32*(4), 558-562.

Riessman, F. . (1965). The ‘helper’ therapy principle. *Social Work, 10*(2), 27-32.

Rimer, B.K, & Kreuter, M.W. (2006). Advancing tailored health communication: A persuasion and message effects perspective. *Journal of Communication, 56*(s1), S184-S201.

Roberts, K. S., & Brent, E. E. (1982). Physician utilization and illness patterns in families of alcoholics. *Journal of Studies on Alcohol and Drugs, 43*, 119-128.

Roblin, D. W. (2011). The potential of cellular technology to mediate social networks for support of chronic disease self-management. *Journal of Health Communication, 16*(sup1), 59-76.

Rohsenow, D. J., Monti, P. M., Rubonis, A. V., Gulliver, S. B., Colby, S. M., Binkoff, J. A., & Abrams, D. B. (2001). Cue exposure with coping skills training and communication skills training for alcohol dependence: 6-and 12-month outcomes. *Addiction, 96*(8), 1161-1174.

Rosen, C. S., Henson, B. R., Finney, J. W., & Moos, R. H. (2000). Consistency of self-administered and interview-based Addiction Severity Index composite scores. *Addiction, 95*(3), 419-425.

Rosenberg, H. (1983). Relapsed versus non-relapsed alcohol abusers: Coping skills, life events, and social support. *Addictive Behaviors, 8*(2), 183-186.

Rothman, A.J, Bartels, R.D, Wlaschin, J, & Salovey, P. (2006). The strategic use of gain- and loss-framed messages to promote healthy behavior: How theory can inform practice. *Journal of Communication, 56*(S1), S202-S220.

Rothrock, N. E., Lutgendorf, S. K., & Kreder, K. J. (2003). Coping strategies in patients with interstitial cystitis: Relationships with quality of life and depression. *The Journal of Urology, 169*(1), 233-236.

Rutten, L. J. F., Arora, N. K., Bakos, A. D., Aziz, N., & Rowland, J. (2005). Information needs and sources of information among cancer patients: A systematic review of research (1980–2003). *Patient Education and Counseling, 57*(3), 250-261.

Ryan, A. M., Shim, S. S., Lampkins-uThando, S. A., Kiefer, S. M., & Thompson, G. N. (2009). Do gender differences in help avoidance vary by ethnicity? An examination of African American and European American students during early adolescence. *Developmental Psychology, 45*(4), 1152-1163.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68-78.

Ryan, R. M., Patrick, H., Deci, E. L., & Williams, G. C. (2008). Facilitating health behaviour change and its maintenance: Interventions based on self-determination theory. *The European Health Psychologist, 10*(1), 2-5.

Salem, D.A, Bogat, G.A, & Reid, C. (1997). Mutual help goes on-line. *Journal of Community Psychology, 25*(2), 189-207.

Sandberg, G. G., & Marlatt, G. A. (1991). Relapse prevention In D. A. Ciraulo & R. I. Shader (Eds.), *Clinical manual of chemical dependence* (pp. 377-399). Washington, DC: American Psychiatric Association

Sautier, L., Mehnert, A., Höcker, A., & Schilling, G. (2014). Participation in patient support groups among cancer survivors: Do psychosocial and medical factors have an impact? *European Journal of Cancer Care, 23*(1), 140-148.

Schaefer, C., Coyne, J. C., & Lazarus, R. S. (1981). The health-related functions of social support. *Journal of Behavioral Medicine, 4*(4), 381-406.

Schulz, U., & Schwarzer, R. (2004). Long-term effects of spousal support on coping with cancer after surgery. *Journal of Social and Clinical Psychology, 23*(5), 716-732.

Schwartz, C., Meisenhelder, J. B., Ma, Y., & Reed, G. (2003). Altruistic social interest behaviors are associated with better mental health. *Psychosomatic Medicine, 65*(5), 778-785.

Schwartz, C., & Sendor, R. M. (1999). Helping others helps oneself: Response shift effects in peer support. *Social Science & Medicine, 48*(11), 1563-1575.

Seale, C., Ziebland, S., & Charteris-Black, J. (2006). Gender, cancer experience and internet use: A comparative keyword analysis of interviews and online cancer support groups. *Social Science & Medicine, 62*(10), 2577-2590.

Seeman, T. E., Bruce, M. L., & McAvay, G. J. (1996). Social network characteristics and onset of ADL disability: MacArthur studies of successful aging. *Journals of Gerontology: Psychological Sciences and Social Sciences, 51*(4), S191-S200.

Shah, D. V., Cho, J., Nah, S., Gotlieb, M. R., Hwang, H., Lee, N.-J., . . . McLeod, D. M. (2007). Campaign ads, online messaging, and participation: Extending the communication mediation model. *Journal of Communication, 57*(4), 676-703.

Shaw, B. R., DuBenske, L. L., Han, J. Y., Cofta-Woerpel, L., Bush, N., Gustafson, D. H., & McTavish, F. M. (2008). Antecedent characteristics of online cancer information seeking among rural breast cancer patients: An application of the Cognitive-Social Health Information Processing (C-SHIP) model. *Journal of Health Communication, 13*(4), 389-408.

Shaw, B. R., Han, J. Y., Kim, E., Gustafson, D. H., Hawkins, R. P., Cleary, J., . . . Lumpkins, C. (2007). Effects of prayer and religious expression within computer support groups on women with breast cancer. *Psycho-Oncology 16*(7), 676-687.

Shaw, B. R., Hawkins, R. P., Arora, N. K, McTavish, F. M., Pingree, S., & Gustafson, D. H. (2006). An exploratory study of predictors of participation in a computer support group for women with breast cancer. *Computers Informatics Nursing, 24*(1), 18-27.

Shaw, B. R., Hawkins, R. P., McTavish, F. M., Pingree, S., & Gustafson, D. H. (2006). Effects of insightful disclosure within computer mediated support groups on women with breast cancer. *Health Communication, 19*(2), 133-142.

Shaw, B.R, McTavish, F.M, Hawkins, R.P, Gustafson, D.H, & Pingree, S. (2000). Experiences of women with breast cancer: Exchanging social support over the CHESS computer network. *Journal of Health Communication, 5*(2), 135-159.

Sher, K. J., Gotham, H. J., Erickson, D. J., & Wood, P. K. (1996). A prospective, high-risk study of the relationship between tobacco dependence and alcohol use disorders. *Alcoholism: Clinical and Experimental Research, 20*(3), 485-492.

Sher, K. J., & Levenson, R. W. (1982). Risk for alcoholism and individual differences in the stress-response-dampening effect of alcohol. *Journal of Abnormal Psychology, 91*(5), 350-368.

Shiffman, S. (1982). Relapse following smoking cessation: A situational analysis. *Journal of Consulting and Clinical Psychology, 50*(1), 71-86.

Short, J., Williams, E., & Christie, B. (1976). The social psychology of telecommunications. New York, NY: John Wiley & Sons.

Simpson, D. D. (2004). A conceptual framework for drug treatment process and outcomes. *Journal of Substance Abuse Treatment, 27*(2), 99-121.

Sinha, R. (2001). How does stress increase risk of drug abuse and relapse? *Psychopharmacology, 158*(4), 343-359.

Sinha, R. (2012). How does stress lead to risk of alcohol relapse? *Alcohol Research: Current Reviews, 34*(4), 432-440.

Smyth, J. M., & Pennebaker, J. W. (1999). Sharing one's story: Translating emotional experiences into words as a coping tool. In C. R. Snyder (Ed.), *Coping: The psychology of what works* (pp. 70-89). New York, NY: Oxford University Press.

Song, H., Nam, Y., Gould, J., Sanders, W. S., McLaughlin, M., Fulk, J., . . . Ruccione, K. S. (2012). Cancer survivor identity shared in a social media intervention. *Journal of Pediatric Oncology Nursing, 29*(2), 80-91.

Sproull, L., & Kiesler, S. (1986). Reducing social context cues: Electronic mail in organizational communication. *Management Science, 32*(11), 1492-1512.

Stapleton, J. A., Russell, M. A., Feyerabend, C., Wiseman, S. M., Gustavsson, G., Sawe, U., & Wiseman, D. (1995). Dose effects and predictors of outcome in a randomized trial of transdermal nicotine patches in general practice. *Addiction, 90*(1), 31-42.

Steptoe, A., Wardle, J., Pollard, T. M., Canaan, L., & Davies, G. J. (1996). Stress, social support and health-related behavior: A study of smoking, alcohol consumption and physical exercise. *Journal of Psychosomatic Research, 41*(2), 171-180.

Stinson, F. S., Grant, B. F., Dawson, D. A., Ruan, W. J., Huang, B., & Saha, T. (2006). Comorbidity between DSM-IV alcohol and specific drug use disorders in the United States. *Alcohol Research and Health, 29*(2), 94-106.

Substance Abuse and Mental Health Services Administration (2013). Results from the 2012 national survey on drug use and health: Summary of national findings. Retrieved from http://www.samhsa.gov/data/NSDUH/2012SummNatFindDetTables/NationalFindings/NSDUHresults2012.pdf

Swan, A. J., & Tyssen, E. G. (2009). Enhancing treatment access: Evaluation of an Australian Web-based alcohol and drug counselling initiative. *Drug and Alcohol Review, 28*(1), 48-53.

Tannen, D. . (1990). *You just don't understand: Women and men in conversation*. New York, NY: William Morrow.

Taylor, S. E, Falke, R. L, Shoptaw, S. J, & Lichtman, R. R. (1986). Social support, support groups, and the cancer patient. *Journal of Consulting and Clinical Psychology, 54*(5), 608-615.

Thoits, P. A. (1982). Conceptual, methodological, and theoretical problems in studying social support as a buffer against life stress. *Journal of Health and Social Behavior, 23*, 145-159.

Thoits, P. A. (1985). Social support and psychological well-being: Theoretical possibilities. In I. G. Sarason & B. R. sarason (Eds.), *Social support: Theory, research, and applications* (pp. 51-72). Dordrecht, The Netherlands: Martinus Nijhoff.

Thoits, P. A. (1986). Social support as coping assistance *Journal of Consulting and Clinical Psychology, 54*, 416-423.

Thoits, P. A. (1995). Stress, coping, and social support processes: Where are we? what next? *Journal of Health and Social Behavior, 35*, 53-79.

Thompson, E. , Solà, I., & Subirana, M. (2005). Non-invasive interventions for improving well-being and quality of life in patients with lung cancer: A systematic review of the evidence. *Lung Cancer, 50*(2), 163-176.

Thompson, E. R. (2007). Development and validation of an internationally reliable short-form of the positive and negative affect schedule (PANAS). *Journal of Cross-Cultural Psychology, 38*(2), 227-242.

Thompson, T., Rodebaugh, T. L., Pérez, M., Schootman, M., & Jeffe, D. B. (2013). Perceived social support change in patients with early stage breast cancer and controls. *Health Psychology, 32*(8), 886-895.

Tidwell, L. C., & Walther, J. B. (2002). Computer-mediated communication effects on disclosure, impressions, and interpersonal evaluations: Getting to know one another a bit at a time. *Human Communication Research, 28*(3), 317-348.

Triandis, H. C. (2001). Individualism-collectivism and personality. *Journal of Personality, 69*(6), 907-924.

Tsuang, M. T., Lyons, M. J., Meyer, J. M., Doyle, T., Eisen, S. A., Goldberg, J., . . . Eaves, L. (1998). Co-occurrence of abuse of different drugs in men: The role of drug-specific and shared vulnerabilities. *Archives of General Psychiatry, 55*(11), 967-972.

Uchino, B. N. (2004). The meaning and measurement of social support In B. N. Uchino (Ed.), *Social support and physical health: Understanding the health consequences of relationships* (pp. 9-32). New Haven, CT: Yale University Press.

Uchino, B. N., Cacioppo, J. T., & Kiecolt-Glaser, J. K. (1996). The relationship between social support and physiological processes: A review with emphasis on underlying mechanisms and implications for health. *Psychological Bulletin, 119*(3), 488-531.

Ullman, S. E., & Najdowski, C. J. (2010). Alcohol-related help-seeking in problem drinking women sexual assault survivors. *Substance Use & Misuse, 45*(3), 341-353.

Underwood, B., & Moore, B. S. (1982). The generality of altrusim in children In N. Eisenberg (Ed.), *The development of prosocial behavior* (pp. 25-52). New York, NY: Academic Press.

Vaillant, G. E. (2000). Adaptive mental mechanisms: Their role in a positive psychology. *American Psychologist, 55*(1), 89-98.

Van Uden-Kraan, C. F., Drossaert, C. H. C., Taal, E., Seydel, E. R., & van de Laar, M. A. F. J. (2009). Participation in online patient support groups endorses patients' empowerment. *Patient Education and Counseling, 74*(1), 61-69.

van Uden-Kraan, C. F., Drossaert, C. H. C., Taal, E., Shaw, B. R., Seydel, E. R., & van de Laar, M. A. F. J. (2008). Empowering processes and outcomes of participation in online support groups for patients with breast cancer, arthritis, or fibromyalgia. *Qualitative Health Research, 18*(3), 405-417.

Van Uden-Kraan, C. F., Drossaert, C. H. C., Taal, E., Smit, W. M., Moens, H. J. B., & Van de Laar, M. A. F. J. (2011). Determinants of engagement in face-to-face and online patient support groups. *Journal of Medical Internet Research, 13*(4), e106.

VanLear, C. A., Sheehan, M., Withers, L. A., & Walker, R. A. (2005). AA online: The enactment of supportive computer mediated communication. *Western Journal of Communication, 69*(1), 5-26.

Vogel, D. L., & Wester, S. R. (2003). To seek help or not to seek help: The risks of self-disclosure. *Journal of Counseling Psychology, 50*(3), 351-361.

Walther, J. B. (1992). Interpersonal effects in computer-mediated interaction: A relational perspective. *Communication Research, 19*, 52-90.

Walther, J. B. (1995). Relational aspects of computer-mediated communication: Experimental observations over time. *Organization Science, 6*(2), 186-203.

Walther, J. B. (1996). Computer-mediated communication: Impersonal, interpersonal, and hyperpersonal interaction. *Communication Research, 23*(1), 3-43.

Walther, J. B. (1997). Group and interpersonal effects in international computer-mediated collaboration. *Human Communication Research, 23*(3), 342-369.

Walther, J. B. (2007). Selective self-presentation in computer-mediated communication: Hyperpersonal dimensions of technology, language, and cognition. *Computers in Human Behavior, 23*(5), 2538-2557.

Walther, J. B. (2011). Theories of computer-mediated communication and interpersonal relations. In M. L. Knapp & J. A. Daly (Eds.), *The handbook of interpersonal communication* (4th ed., pp. 443-479). Thousand Oaks, CA: Sage.

Walther, J. B., & Boyd, S. (2002). Attraction to computer-mediated social support. In C. A. Lin & D. Atkin (Eds.), *Communication technology and society: Audience adoption and uses* (pp. 153-188). Cresskill, NJ: Hampton Press.

Walther, J. B., Liang, Y. J., DeAndrea, D. C., Tong, S. T., Carr, C. T., Spottswood, E. L., & Amichai-Hamburger, Y. (2011). The effect of feedback on identity shift in computer-mediated communication. *Media Psychology, 14*(1), 1-26.

Walther, J. B., Loh, T., & Granka, L. (2005). Let me count the ways the interchange of verbal and nonverbal cues in computer-mediated and face-to-face affinity. *Journal of Language and Social Psychology, 24*(1), 36-65.

Walther, J. B., & Parks, M. R. (2002). Cues filtered out, cues filtered in: Computer-mediated communication and relationships. In M. L. Knapp & J. A. Daly (Eds.), *Handbook of interpersonal communication* (3rd ed., Vol. 529-563). Thousand Oaks, CA: Sage.

Walther, J. B., Pingree, S., Hawkins, R. P., & Buller, D. B. (2005). Attributes of interactive online health information systems. *Journal of Medical Internet Research, 7*(3), e33.

Walther, J. B., Slovacek, C. L., & Tidwell, L. C. (2001). Is a picture worth a thousand words? Photographic images in long-term and short-term computer-mediated communication. *Communication Research, 28*(1), 105-134.

Warner, L. M., Schüz, B., Wurm, S., Ziegelmann, J. P., & Tesch-Römer, C. (2010). Giving and taking - Differential effects of providing, receiving and anticipating emotional support on quality of life in adults with multiple illnesses. *Journal of Health Psychology, 15*(5), 660-670.

Waterman, A. S. (1984). *The psychology of individualism* New York, NY: Praeger

Watson, D., & Hubbard, B. (1996). Adaptational style and dispositional structure: Coping in the context of the five-factor model. *Journal of Personality, 64*(4), 737-774.

Weitzel, J. A., Bernhardt, J. M., Usdan, S., Mays, D., & Glanz, K. (2007). Using wireless handheld computers and tailored text messaging to reduce negative consequences of drinking alcohol. *Journal of Studies on Alcohol and Drugs, 68*(4), 534-537.

Wellman, B., & Gulia, M. . (1999). The network basis of social support: A network is more than the sum of its ties. In B. Wellman (Ed.), *Networks in the global village: Life in contemporary communities* (pp. 83-118). Boulder, CO: Westview Press.

White, A., Kavanagh, D., Stallman, H., Klein, B., Kay-Lambkin, F., Proudfoot, J., . . . Hines, E. . (2010). Online alcohol interventions: A systematic review. *Journal of Medical Internet Research, 12,* e62.

White, M., & Dorman, S. M. (2001). Receiving social support online: Implications for health education. *Health Education Research, 16*(6), 693-707.

White, W. L. (2009). The mobilization of community resources to support long-term addiction recovery. *Journal of Substance Abuse Treatment, 36*(2), 146-158.

Wills, T. A. (1985). Supportive functions of interpersonal relationships. In S. Cohen & S. L. Syme (Eds.), *Social support and health* (pp. 61-82). Orlando, FL: Academic Press.

Wills, T. A. (1990). Social support and the family. In E. A. Blechman (Ed.), *Emotions and the family: For better or for worse* (pp. 75-98). Hillsdale, NJ: Erlbaum.

Wills, T. A., Blechman, E. A., & McNamara, G. (1996). Family support, coping, and competence. In E. M. Hetherington & E. A. Blechman (Eds.), *Stress, coping, and resiliency in children and the family* (pp. 107-133). Hillsdale, NJ: Erlbaum.

Wills, T. A., & Cleary, S. D. (1996). How are social support effects mediated? A test with parental support and adolescent substance use. *Journal of Personality and Social Psychology, 71*(5), 937-952.

Wills, T. A., & Filer, M. (1996). Stress-coping model of adolescent behavior problems. In T. H. Ollendick & R. J. Prinz (Eds.), *Advances in clinical child psychology*. New York, NY: Plenum.

Wills, T. A., & Shiffman, S. (1985). Coping and substance use: A conceptual framework In S. Shiffman & T. A. Wills (Eds.), *Coping and substance use* (pp. 3-24). Orlando, FL: Academic Press.

Winzelberg, A. J. (1997). The analysis of an electronic support group for individuals with eating disorders. *Computers in Human Behavior, 13*(3), 393-407.

Wise, M. E., Han, J. Y., Shaw, B. R., McTavish, F. M., & Gustafson, D. H. (2008). Effects of using online narrative and didactic information on healthcare participation for breast cancer patients. *Patient Education and Counseling, 70*(3), 348-356.

Wood, J. T. (1993). Engendered relations: Interaction, caring, power, and responsibility in intimacy. In S. Duck (Ed.), *Social context and relationships* (pp. 26-54). Newbury Park, CA: Sage.

Wright, K. B. (2000). Computer-mediated social support, older adults, and coping. *Journal of Communication, 50*(3), 100-118.

Wright, K. B. (2002). Social support within an on-line cancer community: An assessment of emotional support, perceptions of advantages and disadvantages, and motives for using the community from a communication perspective *Journal of Applied Communication Research, 30*, 195-209.

Wright, K. B., & Miller, C. H. (2010). A measure of weak-tie/strong-tie support network preference. *Communication Monographs, 77*(4), 500-517.

Xie, B. (2008). Multimodal computer-mediated communication and social support among older chinese Internet users. *Journal of Computer-Mediated Communication, 13*(3), 728-750.

Yalom, I. D. (1985). *The theory and practice of group psychotherapy* (3rd ed.). New York, NY: Basic Books.

Ybarra, M. L., & Suman, M. (2006). Help seeking behavior and the Internet: A national survey. *International Journal of Medical Informatics, 75*(1), 29-41.

Yoo, W., Chih, M.-Y., Kwon, M.-W., Yang, J., Cho, E., McLaughlin, B., . . . Gustafson, D. H. (2013). Predictors of the change in the expression of emotional support within an online breast cancer support group: A longitudinal study. *Patient Education and Counseling, 90*, 88-95.

Yoo, W., Namkoong, K., Choi, M., Shah, D. V., Tsang, S., Hong, Y., . . . Gustafson, D. H. . (2014). Giving and receiving emotional support online: Communication competence as a moderator of psychosocial benefits for women with breast cancer *Computers in Human Behavior, 30*, 13-22.

Zaichkowsky, J. L. (1985). Measuring the involvement construct. *Journal of Consumer Research, 12*(3), 341-352.

Zebrack, B. J. (2008). Information and service needs for young adult cancer patients. *Supportive Care in Cancer, 16*(12), 1353-1360.

Zebrack, B. J., Block, R., Hayes-Lattin, B., Embry, L., Aguilar, C., Meeske, K. A., . . . Cole, S. (2013). Psychosocial service use and unmet need among recently diagnosed adolescent and young adult cancer patients. *Cancer, 119*(1), 201-214.

Zuckerman, M., & Kuhlman, D. M. (2000). Personality and risk-taking: Common bisocial factors. *Journal of Personality, 68*(6), 999-1029.

Appendix A: Coding Schemes for Emotional Support Categories

CODING CATEGORIES
- ACCOUNTS
  - NOT_SLEEP
    - @NOT_SLEEP [#NEGATIVE_MODAL_VERBS BEFORE SLEEP /S 5]
  - STATUS_UPDATES
    - @STATUS_UPDATES [#TIME NEAR #ALCOHOL_ADDICTION /S 5]
- CARE/PHYSICAL AFFECTION
  - HAVE
    - @HAVE [HAVE BEFORE #POSITIVE_EMOTIONS /C 10]
  - HUGS AND KISSES
    - @HUGS_AND_KISSES [HUG AND KISS /C]
  - LOVE
    - @LOVE [LOVE BEFORE #YOU | LOVE BEFORE #OTHERS /C 10]
  - MISS
    - @MISS [MISS BEFORE #OTHERS | MISS BEFORE #YOU /C 10]
  - TAKE CARE
    - TAKE_CARE
  - THANK NOT GOD
    - @TAHNK_NOT_GOD [THANK NOT NEAR GOD /S 5]
  - WELCOME
    - WELCOME
- CHRISTINA BELIEFS/PRAYER
  - GOD BLESS
    - @GOD_BLESS [GOD BEFORE BLESS & GOD BEFORE YOU /C 10]
    - GOD_BLESS
  - PRAY
    - @PRAY [I BEFORE PRAY | I BEFORE PRAYING /C 10]
  - YOU IN PRAYERS
    - @YOU_IN_PRAYERS [#YOU NEAR PRAYER /S 10]
- CLEAR-CUT REQUESTS
  - NEED_HELP
    - @NEED_HELP [NEED NEAR HELP | NEED NEAR SUPPORT /C 5]
  - PRAY_FOR_ME
    - @PRAY_FOR [PRAY BEFORE FOR & PRAY NOT NEAR I /S 5]
- EMPATHY/SYMPATHY
  - CONCERN YOU
    - @CONCERN_YOU [CONCERN BEFORE #YOU /C 5]
  - POSITIVE RECOGNITION
    - @POSITIVE_RECOGNITION [#POSITIVE_EMOTIONS NEAR #NOTICE_YOU /S 5]
  - SAD YOU
    - @SAD [SAD BEFORE #NOTICE_YOU /C 5]
  - SORRY YOU
    - @SORRY [SORRY BEFORE #NOTICE_YOU /C 5]
  - UNDERSTAND YOU
    - I_KNOW_YOU
      - @I_KNOW_YOU [I BEFORE KNOW & I BEFORE #YOU /S 5]
    - UNDERSTAND_YOU
      - @UNDERSTAND_YOU [UNDERSTAND BEFORE #YOU /C 5]
- ENCOURAGEMENT/REASSURANCE
  - CONGRATULATION
    - CONGRATULATION
  - GOOD GREAT JOB
    - @GOOD_GREAT_JOB [JOB AFTER GOOD | JOB AFTER GREAT /S 1]

Appendix A: Coding Schemes for Emotional Support Categories (continued)

- HANG IN THERE
  - HANG_IN_THERE
- HAPPY FOR YOU
  - HAPPY_FOR_YOU
- HERE FOR YOU
  - @HERE_FOR [HERE BEFORE FOR /C 5]
- HOPE
  - HOPE OTHERS
    - @HOPE_OTHERS [HOPE NEAR #OTHERS & HOPE NEAR #POSITIVE_EMOTIONS /C 5]
  - HOPE YOU
    - @HOPE_YOU [HOPE NEAR #YOU & HOPE NEAR #POSITIVE_EMOTIONS /C 5]
  - LUCK
    - @LUCK [LUCK NEAR #POSITIVE_EMOTIONS /S 5]
- IF NEED
  - @IF_NEED [IF BEFORE YOU & IF BEFORE NEED /C 10]
- KEEP
  - KEEP BE KEEP
    - @KEEP_BE_KEEP [KEEP BEFORE BE | KEEP BEFORE KEEP /C 5]
  - KEEP CONTACT
    - @KEEP_CONTACT [KEEP BEFORE #CONTACT /C 10]
  - KEEP DO FIGHT
    - @KEEP_DO_FIGHT [KEEP BEFORE DO | KEEP BEFORE FIGHT /C 5]
  - KEEP FOCUS COME
    - @KEEP_FOCUS_COME [KEEP BEFORE FOCUS | KEEP BEFORE COME /C 5]
  - KEEP FOLLOW MOVE
    - @KEEP_FOLLOW_GET [KEEP BEFORE FOLLOW | KEEP BEFORE MOVE /C 5]
  - KEEP GO GROW
    - @KEEP_GO_GROW [KEEP BEFORE GO | KEEP BEFORE GROW /C 5]
  - KEEP HOLD ADD
    - @KEEP_HOLD_ADD [KEEP BEFORE HOLD | KEEP BEFORE ADD /C 5]
  - KEEP REAL SIMPLE
    - @KEEP_REAL_SIMPLE [KEEP BEFORE REAL | KEEP BEFORE SIMPLE /C 5]
  - KEEP SAFE
    - @KEEP_SAFE [KEEP BEFORE SAFE /C 5]
  - KEEP WORK UP
    - @KEEP_WORK_UP [KEEP BEFORE WORK | KEEP BEFORE UP /C 5]
- NO WORRY
  - @NO_WORRY [#NEGATIVE_MODAL_VERBS BEFORE WORRY /C 10]
- PROUD YOU
  - @PROUD_YOU [PROUD BEFORE #YOU /S 5]
- STAY
  - @STAY [STAY BEFORE #ALCOHOLISM_TREATMENT_WORDS /C 10]
- WAY TO GO
  - WAY_TO_GO
- WISH
  - WISH
    - @WISH [WISH NEAR #POSITIVE_EMOTIONS /S 5]
  - WISH OTHERS
    - @WISH_OTHERS [WISH NEAR #OTHERS & WISH NEAR #POSITIVE_EMOTIONS /C 5]
  - WISH YOU
    - @WISH_YOU [WISH NEAR #YOU & WISH NEAR #POSITIVE_EMOTIONS /C 5]
- YOU CAN DO IT
  - CAN_DO_IT

Appendix A: Coding Schemes for Emotional Support Categories (continued)

- GENERAL RELIGIOUS/SPIRITUAL VIEWS
  - GOD POSITIVE
    - @GOD_POSITIVE [GOD NEAR #POSITIVE_EMOTIONS /C 5]
  - THANK GOD
    - @THANK_GOD [THANK BEFORE GOD | THANK BEFORE LORD /S 5]
- NEAGATIVE SENTIMENTS
  - @NEGATIVE [#I BEFORE #NEGATIVE_EMOTIONS /C 10]
- UNIVERSALITY/INTERRELATIONSHIP
  - I_CONTACT
    - @I_CONTACT [I BEFORE #CONTACT /S 5]
  - LOOK_FORWARD
    - @LOOK_FORWARD [LOOK_FORWARD BEFORE #CONTACT /C 10]
  - NOT_ALONE
    - @DON'T_ALONE [#NEGATIVE_MODAL_VERBS BEFORE ALONE /C 5]
    - @NEVER_ALONE [NEVER BEFORE ALONE /C 5]
    - @NOT_ALONE [NOT BEFORE ALONE /C 5]
  - PART_OF_TEAM
    - @PART_OF_TEAM [PART BEFORE TEAM | PART BEFORE PROGRAM /C 5]

Appendix B: Coding Schemes for Idea Categories

- IDEA CATEGORIES
  - ALCOHOL ADDICTION
    - CLEAN
    - COURT
    - CRAVE
    - CRAVING
    - DRINK
    - DRUG
    - DRUG_COURT
    - FREE
    - GRADUATE
    - INPATIENT
    - LEAF
    - NEW_LEAF
    - OUTPATIENT
    - PROGRAM
    - REHABILITATION
    - RELAPSE
    - SOBER
    - SOBRIETY
    - TRANSITION
    - TREATMENT
  - CONTACT
    - CALL
    - COMMUNICATE
    - CONTACT
    - CONVERSATION
    - HEAR
    - INFORM
    - MEET
    - POST
    - REACH
    - REMIND
    - SEE
    - SEND
    - SHARE
    - TALK
    - TEXT
    - TOUCH
    - UPDATE
  - I
    - I
    - MY
    - MYSELF
  - INTERROGATIVE PRONOUNS
    - HOW
    - WHAT
    - WHEN
    - WHERE
    - WHICH
    - WHO
    - WHOM
    - WHY
- INTERVENTION WORDS
  - ACHESS
  - APPLICATION
  - BUTTON
  - CHESS
  - CLIENT
  - COUNSELOR
  - DISCUSS
  - DISCUSSION
  - DOWNLOAD
  - ERROR
  - GROUP
  - IPHONE
  - MEMBER
  - MESSAGE
  - PAGE
  - PHONE
  - PROFILE
  - SMART_PHONE
  - SMARTPHONE
  - STUDY
  - SUPPORT_GROUP
  - SURVEY
  - SYSTEM
- MODAL VERBS
  - CAN
  - COULD
  - DID
  - DO
  - MAY
  - MIGHT
  - MUST
  - OUGHT_TO
  - SHALL
  - SHOULD
  - WILL
  - WOULD
- NEGATIVE EMOTIONS
  - ANGER/PAIN
    - ANGRY
    - CRAZY
    - DIFFICULT
    - FRUSTRATE
    - HARD
    - HURT
    - PAIN
    - ROUGH
    - SERIOUS
    - STRUGGLE
    - TOUGH
    - UPSET
  - ANXIETY
    - ANXIETY

Appendix B: Coding Schemes for Idea Categories (continued)

- BAD
- CONCERN
- FEAR
- FEARFUL
- HORRIBLE
- NERVOUS
- PANIC
- SCARE
- SCARY
- WORRY
- WORSE
- WRONG

SADNESS/LONELINESS/DISAPPOINTMENT

- CRY
- DEPRESS
- DEPRESSION
- ISOLATE
- SAD
- STRESS
- SUFFER

SHAME/EMBARRASSMENT

- OVERWHELM
- POWERLESS
- UNMANAGEABLE

NEGATIVE MODAL VERBS

- CAN_NOT
- CANNOT
- CAN'T
- COULD_NOT
- COULDN'T
- DID_NOT
- DIDN'T
- DO_NOT
- DOES_NOT
- DOESN'T
- DON'T
- MAY_NOT
- MAYN'T
- MIGHT_NOT
- MIGHTN'T
- MUST_NOT
- MUSTN'T
- OUGHT_NOT_TO
- OUGHTN'T
- SHALL_NOT
- SHOULD_NOT
- SHOULDN'T
- WILL_NOT
- WON'T
- WOULD_NOT
- WOULDN'T

NOTICE OTHERS

- @FIND_OTHERS [FIND BEFORE OTHERS /S 10]
- @HEAR_OTHERS [HEAR BEFORE #OTHERS /
- @SEE_OTHERS [SEE BEFORE #OTHERS /S 1

NOTICE YOU

- @FIND_YOU [FIND BEFORE #YOU /S 10]
- @HEAR_YOU [HEAR BEFORE #YOU /S 10]
- @KNOW_YOU [KNOW BEFORE #YOU /C 10]
- @SEE_YOU [SEE BEFORE #YOU /S 10]

OTHERS

- ANYBODY
- ANYONE
- ANYTHING
- EVERYBODY
- EVERYONE
- LADY
- PEOPLE
- SOMEONE

POSITIVE EMOTIONS

- AWESOME
- BEST
- BETTER
- COOL
- FUN
- GLAD
- GOOD
- GRATEFUL
- GREAT
- HAPPY
- NICE
- PROUD
- RELIEVE
- WELL
- WONDERFUL

THOUGHTS

- ADVICE
- COMMENT
- FEEDBACK
- HELP
- IDEA
- RECOMMENDATION
- SUGGESTION
- THOUGHT
- WAY

TIME

- DAY
- MONTH
- TODAY
- WEEKDAY
- WEEKEND
- YEAR

WE

- OUR
- WE
- WE_ALL

Appendix B: Coding Schemes for Idea Categories (continued)